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AUTHOR – AUTEUR

Full Name of Author – Nom complet de l'auteur

M. ANISUL ISLAM

Date of Birth – Date de naissance

2ND MAY, 1952

Canadian Citizen – Citoyen canadien

☐ Yes / Oui ☑ No / Non

Country of Birth – Lieu de naissance

BANGLADESH

Permanent Address – Résidence fixe

Vill. Betka,
P.O. Betka Hat,
Dist. Dhaka
Bangladesh

THESIS – THÈSE

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University – Université

UNIVERSITY OF ALBERTA

Name of Supervisor – Nom du directeur de thèse

DR. A. W. JENKINS

AUTHORIZATION – AUTORISATION

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MONOPOLY AND COMPETITION IN THE REAL ESTATE BROKERAGE INDUSTRY: THEORY AND EVIDENCE

by

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M. ANISUL ISLAM

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SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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(SIGNED) M. Anisul Islam

PERMANENT ADDRESS:

Vill. Betka
P.O. Betka Hat
Dist. Dhaka
Bangladesh

DATED July 31, 1985

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled MONOPOLY AND COMPETITION IN THE REAL ESTATE BROKERAGE INDUSTRY: THEORY AND EVIDENCE submitted by M. ANISUL ISLAM in partial fulfilment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

Alexander W. Jenkins

Supervisor

Shmuel Sharir

Michele Veeman

External Examiner

Date May 21, 1985

DEDICATION

This dissertation is dedicated to my beloved uncle, Shah Jalal, for giving me love and affection since my childhood and constant encouragement and support for my education, and to my mother, late Momena Akhtar Begum, for giving me inspiration from the heavens.

ABSTRACT

The objective of this dissertation has been to undertake a comprehensive theoretical and empirical analysis of the state of competition in a typical Canadian real estate brokerage industry. This industry provides agency services to homeowners and potential buyers. Among many interesting features of the industry (eg. informational advantages of the MLS (Multiple Listing Service)), one which deserves special attention is the temporal stability of brokerage commission rates in spite of cyclical and long-term changes occuring in the upstream housing market and the recent extension of combines laws. An explanation of this and other related phenomena (eg. non-price rivalry) is sought within competing models.

The main focus of the study is thus to determine how and to what extent the brokerage industry conforms to a model of collusion rather than competition. The collusive version of the model provides richer insights into such phenomenon as price stability, price discrimination, excessive non-price rivalry, and continuing high rates of entry in spite of excess capacity. It is argued that oligopolistic coordination is readily achieved and maintained (in spite of a large number of firms, easy entry, and excess capacity) by the successful use of the institutional arrangements inherent in and various restrictive practices associated with the MLS. Recognizing the role of the latter factors, this study also seeks to determine the effectiveness of the extension in 1976 of the Combines Investigation Act to this (and other services) industry in stimulating competition and discouraging undesirable behaviour and performance.

Various predictions of the model are subjected to empirical testing using primary data (eg. questionnaire survey and MLS sales summaries) collected for the Edmonton market. The predictions of the collusive model are in general borne out. On brokerage market structure, it is observed that the industry has been increasingly dominated by a few large firms and has experienced recent and substantial increases in concentration (through mergers), especially since 1976. On brokerage conduct, it is observed that formal collusion prevailed prior to 1976 and possibly informal collusion thereafter; commission rate discounts were less frequent in MLS transactions than the ELS (Exclusive Listing) transactions; large firms were less likely to discount than small firms; the commission rate and the "split" remained unchanged over time; and price discrimination and excess capacity persisted. Excessive non-price rivalry, especially by large firms, may have been used to create brand loyalty and to erect entry/mobility barriers against new/small firms.

The Act has potentially (and inadvertently) contributed to the transformation of the industry from a loose oligopoly (low concentration) with overt collusion into a tight oligopoly (moderate concentration) with tacit coordination.

Major policy recommendations include stricter enforcement of the Act (e.g. investigations, indictments, and convictions for tacit collusion/mergers) accompanied by regulatory measures to change the current MLS institutions/practices. The latter include the following: allowing non-members/homeowners to list their properties in MLS listing catalogues purchasable by potential home buyers; prohibiting the publication of the commission rate and the "split" in the listing/sales catalogues; and prohibiting the listing broker from setting the fee for the selling broker.

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1. INTRODUCTION

The purpose of this dissertation is to shed some light into how and to what extent the real estate brokerage industry (henceforth called the brokerage industry) conforms to a model of collusion rather than competition in a typical Canadian urban centre. It is a particularly timely purpose in view of the recent extension of Canadian anti-combines laws to cover this and other service industries.

The brokerage industry is a service industry. It provides agency services to buyers and sellers of real properties.[1] The size and importance of the industry has been rapidly growing in recent years. In terms of employment, a total number of 1,991 practitioners (316 brokers and 1,675 salesmen) were licensed to operate (see Table 4.12 in Chapter 4) in the Edmonton brokerage market in 1983.[2] This constitutes approximately 0.4 percent of Edmonton population and 1 percent of the labour force.[3] More importantly, this figure implies roughly one practitioner (broker or salesmen) for every 250 people in Edmonton (or equivalently one practitioner for every 90 households).

---

[1] The existence and viable operation of firms in this industry can be ascribed to incomplete and often costly information in the housing market (see Bartlett (1981) for details).

[2] For Alberta, the corresponding number is 7,082 (1,128 brokers and 5,954 salesmen) in 1983 and 7,198 (1,178 brokers and 6,020 salesmen) in 1984. The number of practitioners in 1974 was reported to be 3,860 (480 brokers and 3,380 salesmen) (see Table 4.12 in Chapter 4). The number of practitioners in 1984 represents an increase of about 87 percent over the last 10 years. The distribution of the number of brokers and salesmen for Canada and the provinces for 1974 is reported in Appendix E, Table E.6. This table indicates that about 5,364 brokers and 30,659 salesmen were operating in Canada in 1974.

[3] The Statistics Canada reports that about 4.4 percent of the Edmonton labour force was employed in the Finance, Insurance and Real Estate sector in 1971 (see Edmonton Statistical Review (1979, p 62). A similar percentage is also reported for Canada and the provinces.

In terms of brokerage commissions, estimated brokerage fees from Multiple Listing Services (MLS) sources alone, for example, in Edmonton have increased from $0.66 million in 1956 to $77.3 million in 1979[4] and, for Canada, from $242 million in 1973 to $885 million in 1982.[5] For the United States, brokerage fees are estimated to be $12 billion for 1974.[6] The size and rapid growth[7] of this industry suggest that the level of competition and related pricing efficiency in the industry are matters of significant policy concern. Pricing efficiency is important because of the fact that brokerage fees constitute a significant portion of the closing costs in any real estate transaction.[8] A competitive (relative to a collusive) brokerage market may reduce brokerage fees and thereby reduce the cost of transacting in real properties.

---

[4] The 1979 commission represents, for Edmonton with a population of 500,000 persons, about 4.5% of family disposable income or $150 per capita. Note that the commission income in 1982 dropped to $36 million due to recession in the Edmonton housing market since 1980.

[5] Brokerage fees are estimated by applying a 7% commission rate to the the total dollar value of MLS sales. The latter data are collected from the CREA Report (1982).

[6] See Bartlett (1981), p 79.

[7] The rapid growth of this industry can be attributed to such factors as increasing population, greater geographical and occupational mobility of the labour force, increasing urbanisation, and a growing proportion of resale properties for sale in the real estate market place.

[8] Assuming a 7% commission rate, a home owner, using brokerage services, would have to pay $7,000 as brokerage fees on a $100,000 house.

The brokerage industry has a number of interesting features with important implications for brokerage market structure, behaviour and performance. Some of these features which are of considerable interest are as follows: the usual practice of homeowners (not buyers) paying for brokerage services; fees being expressed as a uniform fixed percentage of the property value; fees being paid only after successful completion of a transaction (fees are not be paid until a buyer is found even though the broker might have incurred search costs); and the informational advantages of the MLS *vis-a-vis* ELS (Exclusive Listing) transacting; among others. In addition, it will be shown that the institutional arrangements, especially cooperative listing services (MLS), underlying the transactions process have important implications for brokerage market structure and related collusive behaviour.[1]

Historically the Canadian brokerage industry has been characterised by collusive arrangements (formal collusion prior to 1976 and possible informal collusion after that). Similar collusive arrangements seem to have arisen in the United States (see Owen (1977) and Owen and Grundfest (1976)). It is important to understand how collusion might be successful in spite of a large number of firms, relatively easy entry, excess capacity and other features (which make collusion less feasible). This study will try to shed light on the underlying factors contributing to the stable collusive behaviour of brokerage firms. The results of the study may also be utilised to suggest policies which would achieve improved industry performance.

---

[1] The methodology developed to study the brokerage industry may also be helpful in understanding the pricing and related behaviour of firms in other intermediate markets such as brokers in the stock/foreign exchange market, banks and other financial intermediaries. Note that the stock brokerage market has been studied by Baxter (1970), Epps (1976), Porter (1979), and West and Tinic (1971).

It is to be noted that the brokerage industry has received some attention in the past. Certain aspects of the industry have recently been studied by Bartlett (1981), Owen (1977), Rosenbluth (1976) and Yinger (1981). Yinger discussed the equilibrium search-and-match behaviour of brokers within the framework of profit maximization. While his pioneering work is useful in many respects, it does not pay attention to important aspects of brokerage market structure and related behaviour (eg. the level of collusion). The Rosenbluth study is primarily a descriptive study of the Vancouver brokerage market. While concentrating primarily on various organizational and institutional features of the industry (eg. government regulation or industry self-regulation), turnover of brokers and salesmen, their earning profiles, his analysis of brokerage pricing and related behaviour (eg. advertising) is quite inadequate.

Bartlett, on the other hand, provides some discussion of brokerage pricing behaviour, but it is doubtful whether his analysis can be accepted as a viable explanation of brokerage price stability over the business cycle and the longer term behaviour of the upstream housing market (details in Chapter 2 and Appendix B). Unlike other studies, Owen emphisizes the collusive nature of the industry. Note that neither his analysis nor those of Yinger and Bartlett provide any rigorous empirical evidence to support their hypotheses.[18] These studies rely more on intuitive reasoning and casual observation.

Recognizing the growing size of the industry, its history of formal collusion, its institutionalization of practices facilitating collusion and other developments, this study seeks to determine the current level and nature of industry collusion and the effects, if any, of the recent revision of the Combines Investigation Act of 1976 (henceforth called the Act) upon collusion and related behaviour. It also intends to provide theoretical and empirical insights into related advertising and search behaviour, excess capacity, and patterns of entry. It then outlines policy recommendations which would reduce the level of collusion and improve overall performance in the industry. Thus, unlike previous studies, this study undertakes a rigorous empirical analysis of the Canadian brokerage market.

Various hypotheses and predictions developed in this study are subjected to empirical testing using micro (firm level) data, particularly with a view to assessing the competitiveness of the industry. The data are mainly collected from primary sources. An extensive questionnaire survey of the brokerage firms in the Edmonton Metropolitan housing market was conducted in 1979. Additional data were collected from the MLS sales summaries (monthly issues) published by the Edmonton Real Estate Board. Other relevant data were obtained from the publications of the Edmonton Real Estate Board, the publications and annual reports of the Canadian Real Estate Association, and the Department of Consumer and Corporate Affairs of Alberta.

---

[18] These studies are examined in greater detail in Chapter 2.

The scheme of the study is as follows. Chapter 2 provides necessary background information on the industry such as its institutional arrangements/practices (especially with respect to the Multiple Listing Services (MLS) system) and the level of and trends in industry concentration which may encourage and facilitate stable collusive behaviour. Chapter 3 contrasts a collusive with a non-collusive model of the industry and outlines corresponding testable hypotheses. Chapter 4 examines the evidence on recent brokerage pricing behaviour in order to test the predictions of the collusive/non-collusive models and to determine the efficacy of recent amendments in the Act towards reducing collusion. Chapter 5 discusses the role and determinants of advertising and search behaviour, especially with respect to their relation to collusion. Chapter 6 discusses the Canadian competition policy as it applies to the brokerage industry, while Chapter 7 provides a summary and conclusions of the thesis and suggests policy recommendations. It also discusses the limitations of the study and points to the need for and the direction of further research in this area.

2. THE NATURE, ORGANISATION, AND STRUCTURE OF THE BROKERAGE INDUSTRY

This chapter provides background information as well as a literature survey which permits a better understanding of the behaviour of the brokerage industry. With this aim in mind, it presents a definition of the industry with a view to limiting the scope of the study (section 2.1). The case of transactions without brokers (TWB) is analysed in section 2.2. Section 2.3 discusses transactions with brokers and the institutional arrangements associated with and the limitations of different types of transactions. A brief review of studies of brokerage behaviour is presented in section 2.4. Finally, section 2.5 examines the level of and trends in industry concentration.

2.1 DEFINITION AND NATURE OF THE INDUSTRY AND SCOPE OF THE STUDY

The term 'Real Estate Industry' is not clear cut and is sometimes even confusing. It may encompass a wide variety of activities only imperfectly related to each other. This wide range of activities can be classified into four distinct categories. The first category includes firms who are called speculators in real properties (they usually purchase land, buildings or structures with the sole purpose of resale at a higher expected price at some future date). Firms in the second category are called builders and developers (they are directly involved in production and construction activities in real property such as developing raw land for residential or commercial use, building new homes and structures, and other related activities). In the third category, firms (eg. banks and other financial institutions) are involved in financing (eg. providing mortgage loans) and other ancilliary services associated with the transaction of real property.

The fourth category includes the activities of firms or individuals who are involved in the process of transferring ownership titles to property from one individual to another. These firms are known as real estate brokerage firms. As compared to the first two categories, the firms in this category may not require a large capital investment, nor do they incur a great deal of financial or other risks. They may choose to specialise in one or a suitable combination of the following activities: buying and selling of residential homes, apartments and condominiums (new or used), commercial and industrial properties, and land (raw or developed); property appraisal; counselling; arranging legal services related to property ownership transfer; property management; and renting and/or leasing property.

Since each of the above categories are imperfectly related, each deserves to be treated as a separate industry. This study is mainly concerned with the brokerage industry alone.'' Note that the above classification may not always

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''This does not indicate, however, that the other categories are less important, but rather that the study of all four categories in this project would not be possible given time and resource constraints.

be compact. For example, a builder may be observed to sell his own (or other's) property (a brokerage activity), or a broker may be found to be associated with a builder or speculator. Thus, a firm can have different degrees of specialisation and interlinkages while operating within the 'Real Estate Industry' in a general sense. In such cases, it is not always possible to assign every individual or firm to one of the four specific categories. This, of course, does not pose an insurmountable problem because a large number of firms deal exclusively in the brokerage activities. Only in the case where a firm is involved in an overlapping range of activities is a firm assigned to that particular category from which it generates the major proportion of its income.

Turning now to the relative size and importance of the brokerage industry, it is found that the dollar volume of MLS sales in Edmonton (see Appendix E, Table E.2 for details) increased from $9.4 million in 1956 to $1103.6 million in 1979 (then declining to $507.1 million in 1982 due mainly to severe recession). The estimated brokerage fees from such sales have increased from $0.66 million in 1956 to a record high of $77.3 million in 1979. The 1979 brokerage fees would represent, for Edmonton with a population of 500,000 persons, about 4.5% of family disposable income or $150 per capita. Similar estimates can be obtained for Canada as well as different provinces (See Appendix E, Table E.4 for details). For Canada, for example, the dollar value of MLS sales increased from 3461 million dollars in 1973 to 12644 million dollars in 1982 (an increase of 265 percent over 9 years) while brokerage commission income increased from 242 million to 885 million dollars.

With respect to different types of transactions, it is estimated that, of the total volume of resale properties sold in the metro Edmonton market, about 93 percent were sold by brokers and about 7 percent by owners (TWB) in 1982.[12] The domination of housing sales by broker operated transactions is also observed in the United States. Of the 63 cities surveyed, it is observed that sale by owners does not exceed 30 percent[13] in any city in 1973 (see Appendix E, Table E.1). The broker operated sales can also be classified into ELS (Exclusive Listing Services) and MLS (Multiple Listing Services) transactions. Of all the sales processed through brokers, about 85 percent constituted MLS sales and the remaining 15 percent constituted ELS sales.[14] The relative importance of the MLS system is also evident from the fact that a great majority of brokers and salesmen are members of the local real estate boards and thereby fully participate in the MLS process. For instance, it is observed that about 75 percent[15] of all licensed brokers and salesmen are members and hence are active participants in the MLS process. The above information clearly indicate that the transaction process is dominated by broker operated sales, especially by the MLS process.

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[12] See Islam and Jenkins (1983), p 2. Peter Jennings, the Vice President of an Edmonton based new brokerage firm, Komputermatch Private Property Listing Services Inc., estimates the share of "sale by owner" market to be about 12 percent.

[13] For 12 cities, it is less than 10 percent.

[14] See Islam and Jenkins (1983), p 3. This information is taken from a report by Jim McCreedy in the Edmonton Journal, January 16, 1982 and also confirmed by Arthur Jones, the public relations officer of the Edmonton Real Estate Board.

2.2 TRANSACTIONS WITHOUT BROKERS (TWB)

This is equivalent to sale by owners (sellers) and, in this case, a simple transaction process is involved which can be described by the following relation:

$$S \leftrightarrow B \tag{2.1}$$

where the arrow is used to represent the process of two-way search undertaken by the buyer (B) and the seller (S) in order to locate each other. Since no intermediary is involved, the seller avoids paying any commission to a broker out of the sale proceeds, but the seller (as well as the buyer) has to bear any necessary transaction costs such as time costs (eg. opportunity cost of own time invested in selling/buying) and other search costs (eg. advertising and showing costs).

The seller usually has a particular notion of the lowest price[16], the 'minimum offer price' PS^*, that he would be willing to accept in exchange for his house upon entering the market. His objective would be to maximize the excess of the actual sale price of the house over and above PS^*, net of his time and search costs. It is also possible to view the objective of the home buyer in a symmetrically opposite fashion. He would try to maximize the deficiency of actual purchase price of the house below his 'maximum reservation price' PB^* '', net of his time and search costs.

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[15] This percentage varies from 60 percent to 90 percent in different provinces in Canada in 1973 (see Appendix E, Table E.5).

[16] It should at least reflect the cost of rebuilding the home.

Since information in the housing market is rarely perfect and often costly, it is readily seen that sellers (buyers) would tend to generate 'gains from trade''' by undertaking search activity to locate buyers (sellers) with higher 'reservation prices' (lower 'offer prices'). Will each continue search until he has canvassed all buyers (sellers)? The answer is usually negative because of the constraint of positive search costs. Thus, a rational participant will continue search until the expected marginal benefit (MB) from an additional unit of search equals the expected marginal cost (MC) of search (the latter includes both time and other search costs). The interpretation of MC is straightforward. It is the increment in cost due to an additional unit of search. The expected marginal benefit can be interpreted in terms of the surplus extractable from locating buyers (sellers) of incrementally higher 'reservation prices' (lower 'offer prices') due to an additional unit of search.

''He would not consider buying the house if the actual price is greater than this price.

'''This terminology is due to Bartlett (1981), p 83.

2.3 TRANSACTIONS WITH BROKERS

This section analyses the conditions leading to the development of a brokerage system with its associated institutional arrangements/practices. The brokerage system arises out of the limitations associated with the TWB. With TWB, a single seller (buyer) would be unable to canvass all available buyers (sellers) due to positive search costs. Under such circumstances, the gross 'gains from trade' for individual participants may not be maximized. This might be especially the case for certain participants (those with high time costs). Hence an opportunity arises for a third party (broker) to enter into the market who, by his efforts, can profitably realise a part of the still unrealised 'gains from trade' (after paying for his own costs) and at the same time, reduce the transaction costs of sellers and buyers (i.e. in the form of brokerage fees lower than own (individual) costs of search).

The search costs of the broker are lower than those of individual buyers and sellers for two reasons. (i) Because of the infrequency of housing transactions for individual buyers and sellers, the individual's efficiency of collecting and using information is likely to be lower than that of a broker due to his lack of experience in the market or depreciation of previous knowledge. (ii) In contrast to the individual seller/buyer, the broker can spread his overhead and other joint costs over a larger number of transactions and so reduce his unit costs significantly.

To be viable, the broker needs to solve one additional problem. Because housing is an expensive commodity, it is difficult for brokers to establish direct 'property rights' (eg. through direct purchase) on owners' property.[19] In addition, while selling property without 'property rights', the broker may be unable to prevent resale of information by buyers/sellers[20], because of the 'public good' nature of information. In this situation, brokers have developed a unique method of protecting their interests in the form of creating what is called a system of 'property rights' to the transaction itself.[21] This right is established by asking the seller to sign a 'listing contract' with the broker. This contract[22], gives the broker exclusive right to negotiate the sale of the property of the owner during a specified time period; it also specifies the amount of brokerage fees to be paid by the owner upon closing the transaction.

An important reason for the extensive use of brokerage services by home owners/buyers is evident, i.e. the dichotomous way of extracting brokerage fees from the buyers and sellers. According to the current practice, only home owners pay (directly) the brokerage fees[23] whereas the home

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[19] Note that direct purchase occurs in the used car market.

[20] The seller, for example, may purchase the information at a certain price and then may resell it to some other interested parties.

[21] See Bartlett (1981), pp 84-88 for details.

[22] The different forms this contract may take have been discussed in Appendix B.

[23] It is interesting to ask why homeowners alone (not buyers) pay brokerage fees. One reason might be that brokerage costs (eg. advertising costs) are directly incurred to sell the

buyer does not (he pays a zero price[24] (at least directly)). Thus, the buyer would be better off using the services of brokers as well as search on his own. In addition, the buyer, unlike the seller, is not tied to any broker by a contractual agreement. He can contact as many brokers as he likes, subject to his time cost in contacting brokers. It is thus obvious that a great majority of home buyers would be attracted to brokers. Consequently, it will give brokers some degree of control over a large segment of the stock of potential buyers. Once a vast majority of home buyers come to rely extensively on the services of brokers, it becomes increasingly more difficult for a home owner to find a buyer by his own efforts.[25] Therefore, the very existence of the brokerage system generates forces strong enough to discourage transactions without brokers (TWB).

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[23](cont'd) listings of the homeowner. As a result, brokers may be inclined to charge them directly for the services rendered. It might also be related to the fact that housing is an expensive commodity. The purchase of a house would require a significant amount of investment on the part of buyers. Additional charge in the form of brokerage fees may discourage many potential buyers to use brokerage services. Finally, from a broker's point of view, it is possible that "contracts" with home owners is easier to enforce than that with home buyers.

[24] Buyers may, of course, be indirectly paying to the extent that the seller can pass over a part of his cost to the buyer in the form of higher house prices.

[25] For example, if the seller does not want to contact a broker, he faces at least the following disadvantages: (i) he may not be able to attract many serious buyers; (ii) most of the buyers with higher reservation prices may be steered to the brokers, in which case he may not be getting a high price for his property; and (iii) the time required to sell his property may be significantly longer because of (i) above. All the above factors will tend to enhance a seller's opportunity cost of not employing a broker, once the brokerage system is in existence.

Brokerage processes can be classified into two categories:

(i) Exclusive Listing Services (ELS)

(ii) Multiple Listing Services (MLS)

2.3.1 Exclusive Listing Services (ELS)

This is a case of a simple brokerage system which can be expressed as follows:

$$S \leftrightarrow BR \leftrightarrow B \tag{2.2}$$

In (2.2), compared to (2.1), one additional link between S and B is created, i.e. sellers and buyers communicate through a broker (BR). The seller is required to sign a listing contract with the broker specifying the terms and conditions that are to be observed by both parties in carrying out the transaction. It also gives the broker the exclusive right to negotiate the sale of the listed property on behalf of the seller subject to his final approval.

Several limitations of the ELS system are evident. With ELS, home buyers and sellers are directed to individual brokers and, in this process, the market becomes segmented. Under this system, an individual seller's property will not receive the maximum possible exposure because the listing broker of that property will show it to only those buyers who are attached to that particular broker. As a result of this limited exposure, the potential 'gains from trade' might not be maximised from the seller's point of view. The same argument holds for the home buyer as well (i.e. the buyer may also be attached to one or a few brokers because of his time and other costs) even though the direct charge for brokerage service is zero for him. Therefore, market segmentation may significantly limit the extractable 'gains from trade' for all participants.

Another source of inefficiency arises from an individual broker's strong incentives to distort information in order to influence the buyer towards his own listings, even though he knows very well that other properties in the market (not listed with him) correspond more to the needs of the buyer. To the extent that this happens, it reduces the amount of potential gains for buyers. A possible third source of inefficiency arises from the inordinately intensive search for listings and buyers. Excessive efforts to acquire listings occur because successful sales and related profits are directly related to the size of his inventory of own listings. Moreover, with a larger current share of listings/buyers, a broker would find it easier in the future to attract more buyers/listings due to his reputation.

2.3.2 Multiple Listing Services (MLS)

In most real estate markets, there has evolved a more complicated but interesting and increasingly more common group of transactions which are carried out through the

Multiple Listing Services (MLS).[26] The MLS system can also be called a system of 'cobrokerage' between participating member firms. The transaction process can be described by the following communucation links:

$$S \leftrightarrow LBR \leftrightarrow SBR \leftrightarrow B \tag{2.3}$$

where LBR stands for listing broker and SBR stands for selling broker.

Once a property is listed with the MLS, the sale can be negotiated by any participating (even non-member) broker[27] and the resulting commission income would be shared between the listing and selling broker on a prespecified percentage basis (usually 50-50). The commission rate, the sharing arrangements and the identity of the listing and the (final) selling broker are usually specified in the MLS listing/sales catalogues. The listing agreement between the home owner and the broker in this case takes the form of what Bartlett calls the 'shared property rights' system (in contrast to exclusive 'property rights' associated with the ELS system).

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[26] The MLS is usually organised and executed through some institution or association of brokerage firms such as a 'real estate board' or a 'real estate association'. Usually one such board is organised within the confines of a local real estate market (such as a metropolitan area or a county). In Canada, there are 88 local real estate boards in operation.

[27] Note that non-members are not allowed to list properties with the MLS.

Under the MLS, a broker's commission income can now be derived from three channels: Channel a: commission is generated from sales arising out of the stock of own listings in which case he receives full commission. Channel b: commission is received from his selling the listings of the other brokers. In this case he, as the selling broker, receives a fraction, say β, of the commission. Channel c: In this case, his income is generated through the sale of some of his own stock of listings by other brokers and he, as the listing broker, receives a fraction $(1-\beta)$ of the commission from such sales.[28] The MLS is thus essentially a cooperative arrangement between/among two or more firms in organizing a sale.

An explanation can now be provided as to the existence and relative popularity of the MLS system *vis-a-vis* sale by owners(TWB) and the ELS system. The rationale for the existence of the MLS system can be traced back to the problems and limitations associated with the operation of the simple brokerage (ELS) system. One obvious response to these limitations would be an attempt to reduce the degree of market segmentation[29] and other biases as much as possible. One solution, of course, is to develop a system of cobrokerage through which brokers can cooperate in sharing information with each other.

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[28] In the case of MLS transactions, the listing broker is responsible for paying a portion of his commission to the MLS to cover the costs of MLS operation.

[29] It is interesting to note that brokers attempt to reduce the degree of market segmentation by shifting from ELS to MLS system. Brokers mainly deal in information and such a shift has the potential of improving informational efficiency of transactions. But in the case of other markets (eg. automobiles), firms have incentives to segment the market. These firms usually sell their own products (whereas brokers sell the properties owned by others). It is in their interest to create brand names (through advertising and

The MLS system provides them with such an opportunity. The problem of market segmentation, for example, is eliminated because, with MLS, both buyers and sellers get maximum possible exposure of the property th[illegible] want to buy or sell. The seller is ensured exposure of his property to all buyers in the system because all brokers may try to sell his property once it is listed in the MLS catalogue. In a similar fashion, a buyer can contact only one broker and become informed about all the available listings in the system. This potentially reduces search costs for buyers significantly. It has the additional advantage of reducing the advertising expenditures of brokers to search for home buyers, since a broker need not be so concerned with attracting a buyer because he can approach that buyer indirectly through the MLS anyway.

Another important benefit of the MLS is the (possibility of a) reduction in the incentives of brokers to distort information so as to direct home buyers towards their own individual listings (see also Bartlett (1981). With MLS, this incentive is not totally eliminated but only

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[29] (cont'd) other methods) and thereby segment the market. Creation of brand name and market segmentation give them greater control over the market. Market segmentation occurs in the used car market as well although, like brokers, used car dealers do not sell their own products over which they can establish product specific brand names to segment the market.

partially reduced because, even with MLS, a broker's interests still lie in selling homes from his own listings (since such sales bring full commission) rather than from the stock of other firms' listings (where commission has to be shared with cobrokers).[30] To the extent that these advantages are realised, it can be argued that society as a whole stands to [illegible]ain from having the MLS system.[31]

In Section 2.1, it was observed that the brokerage operated sales are dominated by the MLS process. The reasons for the extensive and overwhelming use of the MLS system *vis-a-vis* other types of transactions (eg. ELS transactions or sale by owners) are now discussed. The basic reason is as follows. The fact that home buyers can purchase brokerage services at a zero (direct) price provides them with strong incentives to seek out brokers. These incentives are even greater for the MLS compared to the ELS because with the former, the buyer now does not need to contact more than one participating MLS broker in order to gain access to all the available MLS listings (which reduces his transaction costs significantly).

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[30] There is a Pareto gain from having the MLS system to the extent that all the parties - the buyer, the seller and the broker - can share the 'gains from trade' arising from the system without necessarily reducing the share of any other party.

[31] It is to be noted that the cost advantages (in terms of advertising , brokers' efforts and other selling costs) of the MLS system are not entirely clear. For example, the indirect communication link back and forth between/among the seller, listing broker, selling broker and the ultimate buyer may enhance transaction costs. In addition, the seller's property will be ultimately sold by one selling broker but in the process (until the property is sold), other brokers incur time and other costs without any return. Third, non-price competition for listings and sales may be unduly elevated if brokers expend considerable time and advertising expenditure to attract listings and to locate byuers of incrementally higher offer prices (an especially resource consuming process when it is recognised that the owner/seller is encouraged to hold out for an even higher offer price by the fact that he pays a marginal commission - at say 7 percent - much smaller in value than the aggregate search costs of the agents attempting to find buyers (see also Islam and Jenkins (1983), p 6)).

Note that the increasing MLS sales may come partly at the expense of ELS sales because it becomes more imperative for home owners to list with an MLS broker in order to have access to the larger pool of home buyers. In addition, brokers have incentives to transfer some of their ELS listings (which are more difficult to sell) into MLS listings (possibly if the ELS listing agreement has expired before the property is sold). Finally, during a recession in the housing market when it is more difficult to find buyers, both home owners and brokers would prefer to list properties with the MLS rather than ELS (for the same commission). Thus the very existence of MLS perpetuates its own survival and development.

2.4 A BRIEF REVIEW OF STUDIES OF BROKERAGE BEHAVIOUR

In a recent paper, Yinger (1981) presented a model of real estate broker behaviour. Using a probabilistic approach, he defined brokerage output in terms of the number of completed transactions or matches, and then discussed the equilibrium search-and-match behaviour of brokers within the framework of profit maximization. His paper draws extensively on the investigations of uncertainty and imperfect information (Stigler (1961); Rothschild (1973) and especially Carlton (1978)). His model focuses on the analysis of a broker's response to uncertain demand for his services.

Uncertainty arises from imperfect information in the housing market - uncertainty about the number of buyers of housing, uncertainty about available listings, and uncertainty about matches between buyers and listings. The demand for matches to be arranged by brokers arises solely from the seller's side of the market and is inversely related to the commission rate. The probability of a match is considered as positively related to the number of listings that the broker possesses. An individual broker's share of total listings is determined by the commission rate he charges and the level of his search for sellers. It is to be noted that, while Yinger's pioneering work is very useful in understanding the search-and-match behaviour of brokers, his study pays very little attention to various important aspects of brokerage market structure and related behaviour (eg. price fixing and price stability). In addition, he does not provide empirical evidence to support various hypotheses developed in the paper (e.g. his share and search equations).

Bartlett (1981), on the other hand, provides an extensive, often intuitive, analysis of the brokerage industry, justifies the the existence of the brokerage system, and discusses a few related aspects of brokerage structure and behaviour (eg. price (commission rate) stability). He rejects the model of 'monopolistic competition' and 'collusion' and explains price stability in terms of the 'shared property rights' system inherent in the MLS process. Bartlett argues that this sharing arrangement transforms the otherwise competitive relations into cooperation between/among brokers and thus eliminates any incentive for price competition. To quote him:

> ...The determination of compensation for both listing and selling broker simultaneously ... creates incentives to avoid price competition. This is specially true when the sharing arrangements formally or informally specifies a fixed 'split' or division of commission for all co-brokered homes....[32]

The structure he refers to is the 'shared property right' system under the MLS. He argues that price cutting would not necessarily increase a broker's revenue and profit even though his share of listings may be increased. This is because, to quote him again:

> ...With fixed splits, a negotiated reduction in the listing rate is *ipso facto* a simultaneous reduction in the compensation earned by cooperating brokers. Any comparable unit listed at the "full" rate will generate higher revenues for the selling brokers and they have a private, individual incentive to focus

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[32] See Bartlett (1981), p 91.

> selling efforts on "full" commission homes. This may well eliminate any benefit from the higher level of lists by reducing the proportion of listings sold per period of time.[33]

A careful analysis of Bartlett's explanation of price stability reveals many shortcomings. First, he discusses the reasons for price stability but does not explain how the price is established in the first place; Second, he recognises but does not explain the existence of the 'fixed' split (i.e. the fixed commission sharing parameter). A 'fixed split' may be the result of formal or informal collusion. Third, with a fixed commission rate and a fixed "split", a secret reduction in the commission rate by the listing broker does not necessarily reduce the compensation for both listing and selling broker as Bartlett argues. Only the compensation of the listing broker need be reduced, with the share going to the selling broker remaining at the level specified by the MLS regulations. The listing broker absorbs the effects of secret rate cutting. If so, then rate cutting will not necessarily reduce the proportion of (own) listings sold as argued by Bartlett (more details in Chapter 3 below).

Fourth, he further argues that if the listing broker cuts price, other (selling) brokers would be less interested in selling these "lower" commission homes and concentrate on selling other "full" commission homes. This will reduce the proportion of the sales of the price-cutting broker. This argument again is not tenable. With the MLS, a broker's sales accrue through three channels. When a broker lists a home at a rate less than the "full" rate (price cutting), the probability of selling through channel (c) would be reduced, to the extent that other brokers are more interested in selling "full" commission homes, as argued by Bartlett. But what he fails to recognise is the fact that broker's chances of sales through channel (a) would be increased because of any increase in his listings due to his lower rates. Thus, an increase in the income of the price-cutting broker through this channel may more than compensate for the loss of income due to lower probability of sales through channel (c). Contrary to Bartlett's argument, it is thus found that there may still be incentives for rate cutting and, to the extent that this is true, his analysis is inadequate in explaining rate stability.

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[33] See Bartlett (1981, p 91).

Fifth, if the assumption of a fixed "split" is dropped, Bartlett's argument would be more difficult to support. This might especially be the case if the selling broker were willing to reduce his share of the commission in order to make any given offer to purchase more readily acceptable to the home owner. Sixth, although his analysis of price stability in terms of 'shared property rights' system may have some relevance for the MLS case, it does not apply to the ELS case. This is because, in the latter case, the system of 'shared property rights' does not arise. Finally, his analysis of the price movements in response to cyclical changes in the upstream housing market is also inadequate in many respects (eg. from a theoretical point of view, the demand for brokerage services is not unambiguously greater during recessions. Appendix B provides a detailed discussion of this issue).

Rosenbluth's (1976) study is primarily a descriptive study of the Vancouver brokerage market. Using survey data, his analysis focuses on the earning profiles of the real estate practitioners (brokers and salesmen) and concludes that their earnings do not differ significantly from other comparable industries. He also presented some evidence on brokerage market structure (eg. size distribution of firms) and behaviour (eg. commission structure). He found moderately high concentration (see section 2.5.1 below) in spite of a high turnover of brokers and salesmen in this industry. He recognized that the brokerage market was cartelised in the past, but concluded that price competition would gradually increase as a consequence of the sectoral extension of the Combines Investigation Act of 1976, prohibiting price fixing in this and other service industries. As will be shown in Chapters 3 and 4 below, this conclusion is based on an inadequate understanding of various institutional features of the brokerage market, especially those facilitating cartel stability (at least in implicit form when overt collusion is prohibited by law).

His study is thus quite inadequate in providing a viable explanation of brokerage price stability and related behaviour (eg. advertising).

Owen, on the other hand, emphasized the collusive nature of the industry. Citing casual evidence, he argued that price-fixing and conspiracy had prevailed in the California brokerage market.[34] He also concluded that price-fixing by brokers was the most important source of high closing costs paid by home buyers and sellers (Owen (1977), p 932). Note that the hypotheses developed in this study are more in line with Owen than Case (1965), Bartlett (1981), Becker (1971), and Yinger (1981). But it should be recognized that Owen's conclusions are not derived from any formal model, nor does he provide adequate empirical evidence to support his conclusions.

2.5 MARKET STRUCTURE AND CONCENTRATION IN THE BROKERAGE INDUSTRY

This section discusses brokerage market structure (as reflected by the number and size distribution of firms) and related market power within the framework of a static as well as dynamic analysis. This analysis is important in determining whether market power/collusion is feasible in this industry. In addition, various structural characteristics can be used to infer the existence and nature of collusive behaviour in a market (see Asch and Seneca (1975); Fraas and Greer (1977); and Hay and Kelley (1974)).

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[34] Conspiracy existed even though the industry was relatively unconcentrated (a few large firms controlled over 10% of the market, and a large number of brokers (178,000 full- and part-time) existed (see Owen (1977), p 945).

Although at first glance one might believe that market power in this industry is low because most local markets display a large number of firms and low entry barriers, it will be shown that concentration in the Edmonton (and conceivably other) markets is high. In order to accomplish this purpose, several widely used indices of concentration (eg. the Herfindahl index[35] (H), Concentration Ratios (CR_n), Variance of Logarithms (v), Theil's Entropy index (T), and Gini Coefficient (GC)) are constructed using firm level data for the period 1971 to 1983 in order to indicate the degree of potential market power.[36]

2.5.1 Measures of Firm Size and Concentration

Before discussing trends in concentration, it is necessary to examine the appropriate measure of firm size in this industry. To the extent that output [37] can be measured by the number of 'completed transactions' (see Yinger (1981)), the available data on housing sales are a useful output proxy. The (firm level) data on housing sales are available (from MLS catalogues) for several years and therefore can be conveniently used to measure firm size and to indicate trends in concentration. It should be mentioned here that an alternative measure of size - employment[38] (number of salesmen employed)- is available from the questionnaire survey. However, this information is available only for the survey year (1979) so that it cannot be used to study trends in industrial concentration. The employment data, however can be utilised to examine the sensitivity of concentration indices to alternative measures of firm size. The details of the sources of data and the measurement of variables are discussed in greater detail in Chapters 4 and 5 below.

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[35] Note that Herfindahl index is arguably a better index than others because it reflects the effect of both the number and the size distribution of firms (see Scherer (1970; p 51) and Islam (1985)).

[36] For an elaboration and a rigorous discussion of the relationship between concentration and market power, see Saving (1970) and Hause (1977).

[37] For a discussion of the definition of output from a theoretical and operational point of view, see Chapter 3 below.

The frequency distribution of salesmen (from questionnaire survey data) for 158 respondents (brokerage firms) in the Edmonton metropolitan housing market is given in Table 2.1. A wide disparity and inequality in the size distribution of firms is quite evident from this table. About 28.6% of the firms are observed to employ less than 2 salesmen and 43.5% to employ less than 4 salesmen, while at the other end of the distribution, there are only 3 firms (1.8% of all firms) who employ more than 128 salesmen each.

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[38] Employment can be a useful measure of firm size and therefore concentration because it avoids measurement problems associated with price changes (as may be encountered while measuring size by sales or assets (for details, see Adelman (1951)). It may also be useful because of the labour-intensive nature of the industry. It should be mentioned, however, that this measure may encounter difficulties if labour productivity changes.

TABLE 2.1: Distribution of Salesmen in the Edmonton Real Estate Brokerage Market, 1979.

No. of Salesmen	No. of Firms	% of Firms	Cumulative % of Firms
1 - 2	46	28.57	28.57
3 - 4	24	14.91	43.48
4 - 8	42	26.09	69.57
9 - 16	26	16.15	85.72
17 - 32	8	4.97	90.69
33 - 64	2	1.24	91.93
65 - 128	7	4.35	96.28
129 - 256	3	1.86	98.14
No Response	3	1.86	100.00
Total	161	100.00	------

Source: Questionnaire Survey of Edmonton Brokerage Industry, 1979.

The indices of concentration based on three alternative dimensions of size, i.e. number of houses sold, dollar volume of housing sales and employment for 1979, are reported in Table 2.2. The data on the number of houses sold and the dollar volume of housing sales by firms are collected from the MLS sales catalogues (monthly issues) published by the Edmonton real estate board. This table also reports some concentration indices for the Vancouver market which are taken from Rosenbluth (1976). This permits a comparison of concentration in the two local markets.

Consider the Edmonton market first in order to examine the sensitivity of concentration indices based on alternative measures of firm size. It is clear that by all CR_n measures, employment concentration appears to be higher than that based on the dollar value of sales, but the CR_n's based on the latter are very close to those based on the number of houses sold. This result is not surprising given the fact that salesmen are usually employed on a commission sharing basis (eg. when a house is sold, the commission is shared by the firm and the salesmen usually on a 50-50 basis) rather than on the basis of salaries/wages. This system of compensation preserves incentives for firms, especially larger ones, to enlarge their labour force (since the marginal cost of hiring an extra salesmen is very low) with the expectation of capturing a larger share of the market. Note that the above-mentioned bias is reduced if one looks at the Herfindahl index, H. Here, it is observed that

TABLE 2.2: Dimension of Firm Size and Concentration Indices.

	Vancouver Market (Rosenbluth)	Edmonton Market		
Indices	Employment	Employment	No. of Houses Sold	Value of Sales
CR3	0.1800	0.2900	0.2800	0.2700
CR4	na	0.3500	0.3200	0.3100
CR6	0.2300	0.4500	0.3900	0.3700
CR8	na	0.5300	0.4600	0.4600
CR10	0.2800	0.6000	0.5200	0.5100
H	na	0.0461	0.0512	0.0516

*Sources: (1) Employment concentration for Vancouver is taken from Rosenbluth (1976).

(2) Employment concentration for Edmonton is calculated using the data collected from the Questionnaire survey of the Edmonton Brokerage Market.

(3) Other indices (using no. of houses sold and value of sales) were calculated using data collected from the MLS Sales Summaries (various monthly issues), 1979.

concentration based on the number of houses sold (also value of sales) is slightly higher than that based on employment.[39]

Turning now to a comparison of concentration in the two local markets, it appears from Table 2.2 (using employment as the measure of firm size which is common in both markets) that CR_3 is 0.18 in Vancouver as compared to 0.29 in Edmonton and for CR_6, the relevant values for the two markets are 0.23 and 0.45 respectively.[40] For the Vancouver market, Rosenbluth concludes that: 'concentration is high but not strikingly so'.[41]

In comparison to the Vancouver market, the available evidence suggests that concentration in the Edmonton market is substantially higher.[42] One possible explanation of much higher concentration in the Edmonton market is that the size of the housing market is smaller here than in Vancouver. The number of firms operating in Edmonton is much smaller, perhaps due to some economies of scale in relation to the smaller size of the market. Concentration in this market can also be compared with concentration in other industries in Canada. Such comparisons indicate that concentration in this market is as high or higher than many manufacturing industries. For example, the Report of the Royal Commission on Corporate Concentration (1978, p41, Table 2.9) reports CR_8 for 1972 to be 0.36 for Pulp and Paper mills, 0.18 for Sawmills and Planning mills, 0.13 for miscellaneous machinery and equipment manufacturing and 0.33 for the dairy products. Note that the latter indices refer to the national market (hence may be underestimates of true (local) concentration), whereas Edmonton is only a local market.[43]

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[39] Since H is arguably a better index (see Islam (1985) and Scherer (1980)) than CR_n, it can be argued that concentration based on the number of houses sold is at least as high as those based on the dollar value of sales or employment.

[40] CR_n is used for comparison because H index is not available for the Vancouver market from Rosenbluth's study.

[41] Rosenbluth (1976), p 9.

[42] It should be noted that Rosenbluth's study refers to 1974 while this study to 1979 but this short time difference is not likely to account for such a large difference in concentration.

2.5.2 Trends in Concentration

Some preliminary idea about the level of and trends in concentration and inequality can be found from some descriptive indicators reported in Table 2.3. The number of firms reporting sales in the MLS sales catalogues steadily increased (see row 1) from 89 in 1971 to 165 in 1979 and then declined slightly in 1981 to 135.[44] Note that the top 20 firms as a group significantly increased their combined share of the market (row 2) from 60.95 percent in 1971 to 71.29 percent in 1981 at the expense of (the growing number of) other firms (row 3). Thus the degree of inequality in the size distribution of firms has tended to increase steadily over the sample period. Hence, although mean firm

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[43] If Edmonton itself consists of sub-markets, even the city-wide concentration indices for Edmonton may also underestimate true concentration.

[44] As a result, top 20 firms as a percentage of those of all firms, declined up to 1979 and increased slightly in 1981 (row 5), while the reverse holds for the remaining firms as a percentage of those of all firms (row 6).

TABLE 2.3: Size Distribution of Firms: Some Descriptive Statistics, 1971-1981

Indicators	1971	1973	1975	1977	1979	1981
1. No. of Firms reporting MLS sales	89	106	117	118	165	135
2. Market Share of Top 20 Firms	60.95	70.66	65.56	67.95	64.34	71.29
3. Market Share of Remaining Firms	39.05	29.34	34.44	32.05	35.66	28.71
4. Number of other Firms	69	86	97	98	145	115
5. Top 20 Firms as % of All Firms	22.47	18.87	17.09	16.95	12.12	14.81
6. Remaining Other Firms as % of All Firms	77.53	81.13	82.91	83.05	87.88	85.19
7. Mean Market Share (ALL Firms)	1.12	0.94	0.85	0.85	0.61	0.74
8. Mean Market Share (of Top 20 Firms)	3.05	3.53	3.28	3.40	3.22	3.57
9. Mean Market Share of Remaining Firms	0.57	0.34	0.36	0.33	0.25	0.25
10a. No. of Firms With Share Above Mean Market Share	27	24	25	22	33	22
10b. 10a. as % of all Firms	30.34	22.64	21.37	18.64	20.00	16.30
11a. No. of Firms With Share Below Mean Market Share	62	82	92	96	132	113
11b. 11a as % of all Firms	69.66	77.36	78.63	81.36	80.00	83.70
12a. Largest Firm's Share as a Multiple of Mean Share	7.26	11.40	12.92	17.33	31.21	27.29
12b. Largest Firm's Share as a Multiple of 2nd largest	1.15	1.55	1.44	2.11	3.68	2.05

*Source: MLS Sales Summaries, Various Issues, 1971 to 1981.

size has declined (as reflected by the decline of the mean market share of all firms (row 7) from 1.12 percent in 1971 to 0.71 percent in 1981), the mean market share of top 20 has increased from 3.05 percent in 1971 to 3.57 percent in 1981, whereas the mean size of the remaining firms has declined from 0.57 percent in 1971 to 0.25 percent in 1981.[45]

In addition to the above evidence, several alternative indices were constructed and are reported in Table 2.4 to indicate trends in concentration. The Herfindahl index, H, is reported in row 1. It increased from 0.0283 in 1971 to 0.0688 in 1981 and 0.12 in 1983[46] (except for a slight decline during the 1973-75 period). Similar large increases are also recorded for other indices. CR_4 increased from 24.0 percent in 1971 to 44.7 percent in 1981 (and 54.0 percent in 1983[47], while CR_8 increased from 38.4 percent in 1971 to 55.3 percent in 1981. Significant increases in concentration are also indicated by the changes in v, T, and GC over the same period of time. It is to be noted that the level of concentration in the Edmonton market in 1985 would be substantially higher if one takes account of two recent proposed mergers (one between Lepage and real estate branch

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[45] Some further interesting information about the trends in the size distribution of firms is obtained from rows 10a through 11b of Table 2.3. In 1971, for example, 27 firms (30.34%) were of a size above the mean firm size and the other 62 firms (69.66%) were below it, whereas in 1981 these numbers were 22 (16.30%) and 113 (83.7%) respectively.

[46] The 1983 figure is taken from Islam and Jenkins (1983), p 5.

[47] Islam and Jenkins (1983), p 5.

TABLE 2.4: Trends in Inequality and Concentration, 1971-1981

Concentration Indices	1971	1973	1975	1977	1979	1981
1. H	0.0283	0.0377	0.0364	0.0438	0.0512	0.0688
2. CR4	0.2403	0.3015	0.3109	0.3234	0.3217	0.4471
3. CR8	0.3841	0.4593	0.4502	0.4852	0.4629	0.5526
4. CR10	0.4356	0.5236	0.4995	0.5371	0.5161	0.5911
5. CR20	0.6095	0.7066	0.6556	0.6795	0.6434	0.7129
6. V	0.9343	1.5838	1.2692	1.0899	1.2561	1.2290
7. T	0.5019	0.8520	0.8259	0.8909	1.1086	1.2821
8. GC	0.5293	0.6710	0.6419	0.6482	0.6965	0.7248

*Source: MLS Sales Summaries, Various Issues, 1971 to 1981.

of the Royal Trust and the other between Remax and Langley), both involving larger firms (the rank of Lepage, Royal, Remax, and Langley are respectively 1st, 3rd, 8th, and 14th in 1981 (see Table 2.5).

Another interesting feature of the trends in concentration can be indicated. Note that concentration increased slowly from 1971 to 1976 and rapidly thereafter. CR_4, for example, increased from 24.0 percent in 1971 to 32.3 percent in 1977, while H increased from 0.03 to 0.04 during the same period. But CR_4 and H rose respectively to 44.7 percent and 0.07 by 1981 and to 54.0 percent and 0.12 respectively by 1983. It is further predicted (on the basis of 1981 market shares of firms involved in the two recent mergers) that CR_4 and H would rise to 66 percent and 0.15 respectively in 1985. An explanation for the dramatic rise in concentration especially since 1976 is provided in Chapter 4 (section 4.3.2) below.

2.5.3 Degree of market share instability

The market shares and the ranks of the top 20 firms for selected years from 1971 to 1981 are given in Appendix A Table A.1. Table 2.5 is constructed from this table in order to get a clear picture of the size mobility. The first column of this table gives the rank of the top 20 in descending order while the other columns identify the firm corresponding to a specific rank for a particular year. For example, rank 2 was occupied by different firms in different

TABLE 2.5: Size Mobility of the Top 20 Firms, 1971-1981.

Rank	1971	1973	1975	1977	1979	1981
1	Lepage	Lepage	Lepage	Lepage	Lepage	Lepage
2	Kellough	Buxton	Weber	B. Bros.	Kellough	B. Bros.
3	Weber	Weber.	Buxton	Weber	Royal	Royal
4	Wilroy	United	Sicoli	Kelloogh	B. Bros.	Cowley
5	Buxton	City Savings	B. Bros	Sicoli	Buxton	Spencer
6	Britannia	Royal	Royal	Buxton	Weber	Can. Perm.
7	Killen	B. Bros.	Graham	Royal	Friesen	Friesen
8	Northgate	Graham	City Savings	Graham	Graham	ReMax
9	Principal	Kellough	Kellough	Friesen	Spencer	Buxton
10	Graham	Can. Perm.	Can. Perm.	Spencer	Can. Perm.	Toole
11	Propp. A.	Osborne	Fortune	Toole	Potter	Macauly
12	Allied	Wilroy	Montreal	Can. Perm.	Ashford	Barnes
13	Ingram	Friesen	Spencer	Academy	Pyrmont	Weber
14	Willes	Fortune	Toole	Pyrmont	Rancho	Langley
15	Burns	Mason	Wilroy	Dasilva	Langley	Byrons
16	City Savings	Montreal	Academy	Murray	Bell	Haida
17	Friesen	Baker	Bermont	Haida	Academy	Ashford
18	Gateway	JCM	JMB	Potter	Byrons	Bermont
19	Sande	Saber	Saber	Wilroy	Kennedy	Nu Lane
20	Bermont	Willes	Metro	Riviera	Toole	Potter

*Source: This table is constructed from Appendix A., Table A.1.

years, i.e. by Kellough in 1971, Buxton in 1973, Weber in 1975, Block Brothers in 1977, Kellough in 1979 and finally Block Brothers in 1981, and similarly for the other ranks.

The only exception is the first rank which is occupied by the largest firm, A.E. Lepage. It maintained its position throughout the entire period, while its market share continuously increased from 8.15% in 1971 to 20.21% in 1981 (see Appendix A Table A.1, row 29). It is also to be noted that this firm was 7.26 times larger than the mean firm size in 1971 and it became 27.29 times larger than the mean firm size in 1981 (Table 2.3, row 12a). Note that its size (relative to other firms) would be larger now because of its merger with the real estate branch of the Royal Trust Corporation (the 3rd largest firm in 1981 (see Table 2.5)) in 1984 (its market share is predicted to rise to 28 percent in 1985). It also did not experience any serious threat from any of its neighbouring firms, which is evident from the fact that, relative to the second largest firm, its size was 1.15 times larger in 1971 and it had become more than twice the size of the second largest firm by 1981 (Table 2.3, row 12b).

Another interesting feature is that the composition of the top 20 (or top 4, top 8, top 10, etc.) has been changing as well, indicating that some bigger firms were unable to maintain their dominant position, whereas a few other large firms were rising to prominence. Note that the observed market share instability cannot be attributed to the presence of price competition in this market (for details, see Chapter 4 and Appendix B). It can in fact be attributed to a number of bankruptcies and mergers involving several medium to large firms in this market. For example, a few of the bigger firms such as Buxton, Graham, Kellough and Weber went out of business by 1982. The exit of these firms might have been precipitated by the severe depression in the housing market after 1979. Alongside the decline of such former giants, some other firms such as Lepage, Block Brothers, Royal Trust, Canada Permanent Trust, Remax *et cetera* consistently improved their relative position in the market, i.e. they established themselves among the top 10 (in that order) by 1981 (More discussion follows in Chapter 4, section 4.3.2 below).

2.5.4 Sources of change in market shares

Dynamic analysis of concentration involving sources of change in market shares has been pioneered by Gort (1963), Grossack (1965), Hymer and Pashigian (1962), Simon and Bonini (1958) and others. Dynamic analysis not only supplements results of the static analysis, but in many cases it is even more useful in facilitating inferences about the stability of monopoly power/collusion. Following Grossack (1965), this section develops a dynamic measure (details of the Grossack's methodology is discussed in Appendix A) of industrial concentration which is expected to throw light on the following: (i) whether and to what extent the large firms lost (gained) market shares and (b) if so, to whom (from whom) they lost (gained) shares, i.e. to (from) other large firms or to (from) small firms and/or new entrants.

The Herfindahl index provides a useful analytical tool for the examination of structural change. To construct a dynamic measure, data on the market shares of individual firms are needed for at least two years. Following Grossack (1965), the regression coefficient 'b' of the initial year market shares of firms on the 'reference' year market shares is used to indicate the degree of market share instability. But it alone cannot predict the sources of such change. In order to indicate the sources of change, Grossack obtained the following equation:

$$b = r \cdot RH \tag{2.4}$$

where 'r' is the coefficient of correlation between the 'initial' and the 'reference' year market shares (a value of 'r' close to unity would indicate high stability of market shares between these periods) and RH is the square root of the ratio of Herfindahl indices in two periods (a value of $RH > 1$ would indicate an increasing trend in concentration).

Information on these coefficients can be conveniently used to indicate the relative stability of the market share of leading firms *vis-a-vis* other (smaller firms and/or new entrants) firms. For example, if a value of b less than unity is observed with a low value of 'r' and the value of RH close to unity, the results can be interpreted to indicate that concentration is not rising and that large firms are losing market share to each other. The estimates of the above mentioned coefficients for all available year pairs are reported in Appendix A, Tables A.4 and A.5.

Instead of discussing all the coefficients in Appendix A, Tables A.4 and A.5, it is more convenient to concentrate on a few selected coefficients for further analysis. The selected coefficients reflecting time trends in the coefficients are given in Table 2.6. Looking at the 'b' coefficient (all the coefficients are highly statistically significant (see Appendix Table A.4)), it appears that it has been less than unity up to 1977, implying that large firms were losing shares up to then (during the 1971-73 period, they lost about 19 percent of their market share, during the 1973-75 period, about 16 percent, but less than 2 percent during the 1975-77 period). For the remaining periods, it appears that 'b' is slightly larger than unity, indicating that large firms as a group were gaining market share, although the gains were negligible, i.e. much less than one percent during both the 1977-79 and 1979-81 periods.

~~Now,~~ combining the results on 'b', RH and 'r', the results can be interpreted as follows: During the time periods (1971,73), (1973,75), and (1975,77), there is some evidence that large firms lost market share to each other

TABLE 2.6: Selected Coefficients of 'b', Sq. root of RH and 'r'

Time Periods	(1)	(2)	(3)	
(Year Pairs)	'b'	Sq. root of RH	'r'	Categorisation
(1971, 1973)	0.8110	1.1542	0.7027	Case II
(1973, 1975)	0.8372	0.9826	0.8520	Case II
(1975, 1977)	0.9870	1.0969	0.8998	Case II
(1977, 1979)	1.0009	1.0812	0.9257	Case I
(1979, 1981)	1.0038	1.1592	0.8659	Case I

*Source: Appendix A, Tables A.4 and A.5.

but not to smaller firms and/or new entrants. The results for the periods (1977,79) and (1979,81), on the other hand indicate that large firms did not lose market share to each other. They rather gained market share from small firms and/or new entrants. Since 'b' is very close to unity during these latter periods, this gain is again negligible, and thus these periods can be considered as more stable than the earlier periods. Of course, the fact that r is still less than unity indicates that some degree of instability still persists, although the trend is towards considerable greater stability. This higher degree of market share stability might provide an indication that the dominant group has achieved high and stable prices.**

**A detailed discussion of the analysis and measurement of permanent industrial concentration, following Grossack (1972), is provided in Appendix A.

3. THE ANALYTICAL FRAMEWORK: THE MODEL

This chapter develops an analytical framework for examining brokerage pricing and related behaviour (eg. advertising and entry) under alternative non-collusive and collusive scenarios. Section 3.1 discusses an operational definition of brokerage output and relevant demand and cost conditions. It also provides some general observations about brokerage pricing and related behaviour. The profit functions of brokers are presented in section 3.2. In section 3.3, a non-collusive version of the model is presented. Finally, section 3.4 presents a collusive version of the model. The two alternative versions provide different predictions about brokerage pricing and related behaviour which are subject to empirical testing in subsequent chapters.

3.1 GENERAL OBSERVATIONS ON BROKERAGE BEHAVIOUR

A broker receives a commission, upon successful completion of a transaction, which can be interpreted as the 'price' of brokerage output, whether measured in terms of the number of 'completed transactions' or 'matches' (see Yinger (1981)) between home owners and buyers. Since brokerage firms deal mainly with housing information, output can alternatively be measured as extractable surplus or units of information processed. Although the latter variables are theoretically more plausible, data on them are generally unavailable.[1] As a result, an operational definition of output in terms of the number of 'completed transactions' is used in this study. For subsequent analysis, X is used to denote brokerage output (completed transactions) and P_x is used to denote its unit price (or gross commission received per house sold)

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[1] Note that the latter definitions may encounter operational problems as well because a broker receives commission only

The demand for brokerage output arises from home owners' desires to sell their homes and the desire of potential buyers to purchase those homes.[50] The market demand for brokerage output can be written as $X^d(P_x, J)$, where P_x is the relevant price variable and J represents a vector of other variables (eg. income, building activity) which influence the demand for X.[51] The relationship between X^d and P_x is inverse because an increase in P_x would induce a substitution of own efforts by home owners for brokerage efforts to locate potential buyers.

Consider now brokerage cost/supply conditions.[52] A broker's main function is to collect and process information about disparate groups of sellers and buyers and to

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[49](cont'd) after the listed property is sold. If he fails to arrange a match within the period of the listing contract, he is not entitled to receive any commission, even though he may have incurred costs in the sense of providing some units of information/services.

[50]Note that commissions are directly extracted from home owners (not buyers).

[51]The demand function can be derived using a simple optimization framework of home owners (see Appendix B). Since only home owners directly pay the commission, their behaviour is more directly relevant. A typical home owner can be viewed as maximizing utility (which depends on wealth and leisure), subject to the limitations on the present discounted value of his labour income, non-labour income and the capital gains from the housing transaction (net of brokerage fees, if any).

[52] An example of the derivation of the cost function is discussed in Appendix B.

endeavour to arrange a match. The costs of brokerage operation can be categorised as follows: (a) office and related overhead expenses; (b) search costs which include advertising to locate both listings (sellers) and buyers; and the (c) time and incidental costs for concluding and drawing up listing agreements, showing properties and closing actual transactions. Given a typical broker's production function as X(O, AD, AB, AS) (where O stands for office inputs, AD stands for advertising costs, AB for units of search to locate buyers, and AS for units of search to locate sellers), and given input prices P_O, P_{AD}, P_{AB}, and P_{AS}, a cost minimization framework[53] can be used to derive his supply function. The aggregate supply function, X^s, can be derived as a direct function of price, $X^s(P_x)$, and the relevant total cost function (given input prices) would be given by TC(X), where X measures the level of output.[54]

If the brokerage market is competitive, the interaction of demand and supply would determine competitive price, say P_c, and competitive output, say X_c. If the industry is in long run equilibrium, price would reflect the minimum costs of production of the marginal firm, the latter firm would earn only normal profits, and the number of firms, N_c, would be in long-run equilibrium.

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[53] Note that similar results can be obtained if one uses a profit or output maximization framework, provided that the production function satisfies the usual regularity conditions.

[54] It is to be noted that in deriving brokerage cost functions, it might be more appropriate, from an empirical point of view, to use the dollar volume of sales as a measure of brokerage output. This is because house prices vary considerably. As a result, it is conceivable that different houses would require different amount of brokerage selling efforts (eg. showing costs may be higher for more expensive properties). But measuring output in terms of the dollar volume of sales instead of X would not significantly alter the results.

If there is collusion in this market, price, say P_m, would exceed marginal cost (allocative inefficiency) and would also likely exceed minimum long run average cost (productive inefficiency). Any resulting excess profit would encourage entry of new firms, until prices are driven down and/or costs up and profits down towards normal profit. In addition, some inefficient firms might remain in business.

Also at price P_m, there would be a tendency for excess supply/capacity in the industry in the sense of brokers' being willing to make more matches than demanded at that price.[55] This would encourage brokers to indulge in intensive search for listings and buyers to arrange matches. More discussion on this point is given in section 3.5 below. In addition, with a high turnover of firms and excess capacity, the resulting higher advertising and promotional costs by both new and old firms would lead to higher costs of production and inefficient utilization of resources in the industry (see also Bartlett (1981) and Owen (1977)). In addition, high prices (with low barriers to entry) would encourage entry. The entry of new firms would continue until excess profits are eroded (if all firms are identical). In equilibrium, the industry may include more firms than would prevail if the market behaved competitively.

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[55] Note that it is easier to enforce collusive agreements to fox price than to regulate advertising (or other selling efforts). More details on this point in Chapter 5 below.

Note that the usual practice in the brokerage industry is to extract the price in the form of commission rate (CR) applied to the sale value of the property. The following equation gives the relationship between the gross commission (P_x), the commission rate (CR) and property value (PH):

$$P_x = CR.PH \tag{3.1}$$

Under collusion, CR would be fixed at a level higher than that prevailing under a similar competitive commission structure, say at CR_f, so that equation (3.1) can be written as follows:

$$P_x = CR_f . PH \tag{3.2}$$

Equation (3.2) specifies a uniform (collusive) commission rate which is independent of house prices. It can now be shown that such a uniform fixed commission rate may be potentially price discriminatory and hence indicative of market power/collusion. Rearranging equation (3.1), the commission rate can be expressed by following equation:

$$CR = P_x/PH \tag{3.3}$$

In what sense does a fixed percentage commission rate imply price discrimination? In order to answer this question, totally differentiate equation (3.1) and rearrange terms to obtain the following condition:

$$dP_x = PH \cdot d(CR) + CR \cdot d(PH) \tag{3.4}$$

where d stands for the total differential operator. Dividing both sides of equation (3.4) by d(PH) and rearranging terms, the following equation is obtained:

$$dP_x/d(PH) = PH \cdot d(CR)/d(PH) + CR \tag{3.5}$$

The following cases can be identified from equation (3.5):

Case I: $dP_x/d(PH) = 0$ iff

$$d(CR)/d(PH) = -(CR/PH) \tag{3.6}$$

In this case, gross commission is independent of house price if the commission rate falls proportionately with the rise in house price. This would be expected in a competitive market, assuming selling costs (SC) are fixed[34] (d(SC) = 0) and also independent of house price.

Case II: $dP_x/d(PH) > 0$ iff

$$d(CR)/d(PH) > -(CR/PH) \tag{3.7}$$

In this case, gross commission rises with house price if the commission rate falls less than proportionately with the increase in house prices (perhaps not falling at all so that $\partial(CR)/\partial(PH) = 0$). To the extent that the cost of selling a house does not increase in the same proportion as the increase in house prices, discriminatory pricing pertains.

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[34] Shopping theory may suggest that brokers would show more homes (higher selling costs) the higher the price. Thus d(SC)/d(PH) may be positive. But the above conclusions would still hold if selling costs do not rise in proportion to PH.

Selling costs may not rise in proportion to house prices for the following reason. The costs of selling a house include a fixed and a variable component. In particular, fixed transaction costs (independent of house prices) are associated with the drawing up and signing of a listing contract (including property appraisal), initial (not repeat) advertising in the newspaper, other media, or the MLS catalogues, and closing the deal. Variable costs arise from repeat advertising, personal selling efforts, showing costs , all of which may rise more or less proportionately with house prices and related extractable surplus. Since some costs are fixed and other costs are approximately proportionate to house value, it is quite unlikely that the full costs of selling a $100,000 home will be exactly twice as large as that of selling a $50,000 home. Hence a doubling of gross commissions under a uniform percentage scheme may be unjustified and discriminatory. It can thus be argued that if competition pertains (see Chapter 4, section 4.3.1 below), one may observe a lower commission rate on more expensive properties and a higher commission rate for less expensive properties[51] *ceteris paribus*. On the other hand, if the industry operates under a regime of collusion, one may observe that any secret discount (from the fixed rate) would be more frequent for more expensive properties and less frequent for less expensive ones (for details, see Proposition X in section 3.4.4 below).

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[51] Porter (1983, p 220) reports that since the abolition of fixed commission rate in the New York stock brokerage market

It can be argued that a non-discriminatory, potentially competitive, commission structure might consist of F, a flat fee (to reflect the fixed component of brokerage costs), plus a percentage incentive bonus (to reflect the variable component of brokerage costs). Of course, selling costs in particular may be marginally related to house prices but not necessarily proportionately. In this situation, even Case I may involve price discrimination. In the above example, charging the same commission rate (say 7%) to both homeowners would involve price discrimination against the owner of the more expensive house if the cost of brokerage is less than proportionately related to house price. If there are no differences in selling costs, price discrimination would be extreme.

Note that the uniform discriminatory commission structure (as currently practised) generates lower revenues (but is simpler to administer) than a discriminatory non-uniform commission rate structure such as a two-part or n-block scheme. Leland and Meyer (1976), for example, have demonstrated that the two-part or n-block schemes are at

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''(cont'd) in 1975, the commission rate on sales to individuals fell 18 percent, while commission rate on small orders (less than 200 shares) had actually risen in response to competitive pressure.

least as profitable as a uniform scheme. If brokers were to follow a discriminatory two-part scheme[58], gross commission would consist, say, of a fixed fee[59], F plus a fixed percentage of PH.

Although it is potentially more profitable, brokers do not follow this scheme because F would require periodic cyclical/inflation adjustment which may strain/destabilize oligopolistic coordination (more details in section 3.4 below). Nor have brokers adopted an n-block scheme by applying different commission rates to different transaction classes (these classes can be defined in terms of property values). Again brokers have avoided adopting an n-block scheme because it may increase cartel coordination costs. They have, however, adopted a two-block scheme to the extent that they charge a 7% commission rate on property values up to $100,000 and a marginal rate of 3% for excess value. The declining two-block scheme may reduce the severity of price discrimination but does not eliminate it. Implicit price discrimination may still persist among properties with PH less than $100,000 as well as among properties with PH above $100,000. This scheme is adopted partly because it is more profitable, but perhaps more importantly, to avoid rivalrous discounting on commission for more expensive properties (for more details, see Proposition X in section 3.4.4 below).

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[58] This scheme is at least as profitable as the uniform scheme because he can always set F to zero.

[59] It is to be noted that under non-competitive conditions, F may not accurately reflect the fixed component of selling costs.

3.2 SPECIFICATION OF THE PROFIT FUNCTION

The profit function of a brokerage firm can take two different forms depending on whether one is considering the ELS system or the MLS system. In the ELS case, the total gross commission income can be obtained by multiplying output by the price, i.e. $(P_x.X)$. Given total cost $TC = TC(X)$, the profit function of a representative broker, Π, is given by equation (3.13):

$$\Pi_{ELS} = P_x.X - TC(X) \tag{3.8}$$

Specification of the profit function under the MLS system is more complicated. A broker's income is now derived from three channels (as discussed in Chapter 2). The profit function can be written as follows:

$$\Pi_{MLS} = q_1(P_x.X) + \beta.q_2.(P_x.X) + (1-\beta).q_3.(P_x.X) -$$

$$TC(q_1X,\ q_2X,\ q_3X). \tag{3.9}$$

where β is commission sharing parameter (i.e. the proportion of the commission received by the selling broker (if different from the listing broker)), q_1 is the proportion of X the broker sold from the stock of his own listings (and earned full commission), q_2 is the proportion of X he sold from other broker's listings, and q_3 is the proportion of X sold by other brokers from his own listings. Note that $\Sigma q_i = 1$; $0 \leq q_i \leq 1$.

3.3 THE NON-COLLUSIVE MODEL

A brokerage market is usually characterised by a large number of firms and relatively easy entry. As a result, Case (1978) has suggested that the market is (purely) competitive. Others have argued that the brokerage market may be more appropriately characterised as monopolistically competitive (see Becker (1971)) rather than purely competitive.[illegible] In comparison, this study argues that the brokerage market may be better characterised as collusive. This section presents a non-collusive (monopolistic competition) model of the brokerage industry while its collusive counterpart is presented in section 3.4 below.

In the case of ELS transactions, a profit maximizing broker sets price, P_x, which maximises his profits so that the optimality condition given by equation (3.10) holds:

$$d(\Pi_{ELS})/dX = P_x + X \cdot (dP_x/dX) - dTC/dX = 0 \qquad (3.10)$$

This condition states that a profit maximising broker having limited market power (monopolistic competition) would set optimal price P_x^* for which marginal revenue is equal to marginal cost, MC(X) (assuming second order conditions are satisfied). Given market power, the slope of the demand

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[illegible] Imperfect nature of information and significant positive costs associated with the collection and use of information may have implications for the existence of market power in this industry. It can, in fact, be argued that high search costs for buyers/home owners can generate market power even if other conditions of a purely competitive market are satisfied (see Rothschild (1973); Prat, Wise and Zeckhauser (1979); Salop and Stiglitz (1977)). So too can heterogeneity in the services/locations of brokers.

function is negative and equilibrium price in equation (3.10) exceeds marginal cost.

The relevant profit function to be maximised by firms in the MLS system is given by equation (3.9) and the first order condition for maximum profits in this case is given by equation (3.11):

$$d(\Pi_{MLS})/dX = q_1[P_x + X.dP_x/dX] + q_2.\beta.[P_x + X.dP_x/dX] +$$

$$q_3.(1-\beta)[P_x + X.dP_x/dX] - q_1.dTC/d(q_1X) -$$

$$q_2.dTC/d(q_2X) - q_3.dTC/d(q_3X) = 0 \qquad (3.11)$$

This equation can be interpreted as follows. In setting price, the monopolistically competitive firm equates the weighted average of marginal revenues with the weighted average of marginal costs (the weights being the coefficients outside each bracketed expression in equation (3.11) and consisting of the output allocation parameter[61] and the commission sharing parameter). If there is no market power, dP_x/dX would be zero, and price would be equal to marginal cost. It should be mentioned that, unlike the ELS case, the conditions for profit maximisation in the MLS system also depend on the output allocation parameter and the commission sharing parameter.

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[61] One relevant issue is to determine whether the output allocation parameter q_i is exogenous or endogenous. Although it can be reasonably argued that it is exogenous in the short-run, it might be a choice variable in the long-run. In other words, a broker may wish to choose optimal q_i within the framework of profit maximisation. This issue is not given further consideration in this study.

A few predictions of the non-collusive model can be mentioned:

Proposition I: In the simple case that all firms are identical and provide identical output/services, and if information is perfect and obtainable at negligible costs, a single equilibrium price will prevail under monopolistic competition. But if firms do not provide identical products (services), or buyers and sellers have less than full information (due to high enough search costs), a price dispersion is likely to be observed (see Prat, Wise, and Zeckhauser (1979); Rothschild (1973); Salop and Stiglitz (1977)). In this situation, the price reflecting the minimum average costs would set the floor above which price dispersion would be observed.

Proposition II: Under monopolistic competition, if firms are earning short-run excess profits, new firms would be encouraged to enter into the market. As entry occurs, individual firm's demand will decrease, price will fall and/or average cost rise (for example, because of intensive search for buyers/listings). As a result, excess profit will be eroded in the long run after which no further entry will take place (see Chamberlin (1933); Joskow (1973); and Stigler (1968)).

The above two propositions would hold under both the ELS and MLS transactions.

3.4 THE COLLUSIVE MODEL

In presenting the collusive model, this section gives special attention to the following matters:

(1) Cost/Difficulty of Collusion: Some General Observations;
(2) Collusion in the Brokerage Industry;
(3) Incentives to Cheat and the Difficulty of Coordination;
(4) Factors Facilitating the Stability of Coordination;
(5) Cyclical Variation in the Brokerage Commission Rate;
(6) Cyclical Variation in the Commission Sharing Parameter;

3.4.1 Cost/Difficulty of Coordination: Some General Observations

Collusion is usually observed in a situation where the number of firms is relatively small (oligopoly) and firms recognise interdependence in decision-making (see Chamberlin (1929); Fellner (1965); Scherer (1980); Stigler (1964); and Sweezy (1939)). The price and output under these circumstances are difficult to predict. This uncertainty may create substantial instability in the market. Obviously, this situation is undesirable ~~to the~~ firms and they recognise the need to cooperate/collude rather than to compete.

At this point, it should be recognised that coordination is not costless and, in some cases, the cost (difficulty) of coordination may be so high that it may be unprofitable. The problems of organizing and stabilizing a cartel are extensively discussed in the literature (see Asch and Seneca (1975); Fraas and Greer (1977); Friedman (1971); Green and Porter (1984); Hay and Kelley (1974); Hefflebower (1961); Kuhlman (1969); Orr and MacAvoy (1965); Osborne (1976); Palmer (1972); Scherer (1980); and Spence (1978a and 1978b)). At an industry level, price-fixing is discussed by Costello (1968 ; Tetracycline), Erickson (1969; Folding Bleacher), Erickson (1976; gymnasium seating, rock salt, and structural steel), Kessel (1958; medicine), Owen (1977; title insurance industry and the brokerage industry), Watkins and Adams (1984; fluid milk market), among others.

The cost of coordination are associated with the solution of the following five major problems faced by a cartel[42]: (i) the external problem, which arises from production by non-member firms or potential new entrants (to the extent that such behaviour cannot be predicted and controlled, the stability of market price and coordination is seriously threatened); (ii) location of the contract surface (or joint profit-maximising price and output), which requires information regarding cost conditions for individual firms and the market demand; (iii) the choice of a point on the contract surface (this is essentially the sharing problem, i.e. the determination of the individual firm's output quota); (iv) the problem of detecting cheating (discounting) once collusion is established; and (v) the problem of deterring cheating.

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[42] See Osborne (1976) for details. Also see Spence (1978a and 1978b)).

Under collusion there are incentives for individual firms to cheat. Members therefore must find means to detect and deter cheating by individual members. While standard theory suggests that cartels are inherently unstable because of the sharing and deterring problems, Osborne (1976) persuasively argues that the sharing and deterring problems are not inherently insoluble; in other words, the participating firms can follow a quota rule which will simultaneously solve both the sharing and the deterring problems.[63] The quota rule allows individual firms to adjust price so as to maintain relative market shares and so significantly reduces any individual member's increase in market share and incentive to cheat. Osborne suggests that the fundamental problem lies in the location and the detection problems, with both being accentuated by the existence of external firms. Stigler (1964) also emphisized the detection problem as central to cartel stability.

A lack of information clearly bears on the detection problem. The detection of cheating requires information regarding market share and/or price of each individual member. In general this problem becomes more difficult: (i) the larger the number of participating firms[64]; (ii) the larger the proportion of output controlled by small cartel members[65]; and (iii) the larger the proportion of output controlled by the external firms. In the presence of external firms, it becomes more difficult to identify whether the loss of market share experienced by a member firm is due to cheating by other members or due to increased output by the external firms. Being unable to detect the source of cheating, affected members may retaliate with large discounts, which may in turn threaten the stability of the cartel.

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[63] For details, see Osborne (1976).
[64] With a large number of firms, it is more difficult to identify price cutters since the cost of collecting information increases more than proportionately with the number of firms (see Scherer (1980)).
[65] When these firms as a group control a large proportion of

With respect to the detection problem, it is possible to identify following cases of successively increasing coordinational difficulty: Case I: The output and price of each individual member is known by all and therefore the detection problem is completely solved. The cartel would, therefore, be internally stable. The external firms do not pose any serious difficulty as long as they represent a very small minority. Case II: Members know the output (but not price) of each member; again, output and hence the market share data of individual members can be effectively used to infer possible secret price cutting by rival firms. Cartel detection problem is again solved at a reasonable enforcement cost. Case III: Members know the output supplied by all the members jointly but not the output of individual members. Here, the detection problem becomes more difficult but as Osborne suggests, it can still be solved.‘‘ Case IV:

‘'(cont'd) output (not necessarily larger than the combined share of the dominant group), it may be more difficult to detect cheating. Member firms may then cheat without being identified.

‘‘See Osborne (1976) for details.

Total industry output is known but neither the total nor individual output of members. Case V: Industry output is also unknown. The last three cases would be very unstable because of the serious difficulty in solving the detection (as well as the location) problem. Under these circumstances, if a cartel is formed, it is most likely to be unstable.

3.4.2 Feasibility of Collusion in the Brokerage Industry

In the few previous studies of the brokerage industry, the possibility of collusion received little attention. Chapter 2 suggested that Yinger (1981) gave only a passing reference to this issue. Bartlett's analysis of price stability in terms of a system of 'shared property rights' suffers from the same and other limitations (as discussed in Chapter 2 and Appendix B). Although the possibility of collusion was recognized by Rosenbluth (1976) and Owen (1977), their analyses, as already mentioned in Chapter 2, are inadequate. This section argues that a model of collusion provides a more plausible explanation of observed brokerage price stability.

The possibility of successful collusion is perhaps ignored by researchers in this area because of the fact that the industry is characterised by a large number of firms and relatively easy entry, factors which are presumed to raise coordination costs high enough to make collusion unprofitable. But this section will argue that collusion in this market can succeed in spite of a large number of firms, relatively easy entry, and even excess capacity.

Collusion becomes more feasible when a few firms dominate the industry (as discussed in Chapter 2). Moreover, a sophisticated 'competitive fringe' may respond to the long-run (but not short-run) profit incentive by following the higher price set by the large price leaders. Moreover, even with a large number of firms, informal coordination may give place to formal collusion involving an industry trade association to regulate the behaviour of individual members against secret price cutting (see Fraas and Greer (1977); Hay and Kelley (1974)). Hay and Kelley, for example, report that, in 7 out of 8 cases of collusion with more than 15 members in the cartel, a formal industry trade association was involved.

In the case of the brokerage industry, a formal trade association (in the form of real estate association/board) exists in typical urban markets in Canada and the United States. The local boards are also related, through membership, to the the respective higher (provincial and national) boards. Similar success in collusion has been observed in the fixing of insurance rates in the U.S. property liability insurance industry (see Joskow (1973)); in setting minimum commissions for transactions in the New York Stock Exchange (see Baxter (1970) and West and Tinic (1971); and in the California title insurance and brokerage industry (see Owen (1977), all despite the existence of a large number of firms (often hundreds) and easy entry in these industries.

Competition in a brokerage market may take the form of price or non-price rivalry, the latter, in turn, comprising competition on the basis of service quality or advertising. Note that it would be difficult in a brokerage market to clearly distinguish between service quality and advertising. For example, since brokers deal with information, service quality can be improved by providing more information (eg. more informational ads in newspapers which may result in a quicker sale or a better match for home owners and buyers). As a result, it is advisable to group them under 'non-price' competition/rivalry.

In this market, collusion may take the form of price coordination and/or coordination to restrict non-price competition/rivalry. The latter may take the form of standardizing service quality (eg. type and amount of services to be provided, number of ads, standardized lengths of 'listing contracts', *etc*). Telser (1960, p 90) has argued that service standardization is an activity in restraint of trade and that it facilitates cartel stability. Although both price and non-price coordination is possible, it is more likely that brokers would prefer the former. This is because the former is easier to achieve and easier to monitor than the latter (see Nelson (1974); Scherer (1980); and Stigler (1964)). The greater difficulty of non-price coordination arises because it is more difficult to define and to agree on any specific (or all) dimension(s) that non-price rivalry may assume (more details in Chapter 5 below).

Note also that documented cases of formal collusion have usually taken the form of price coordination. When brokers agree not to compete on the basis of price, it can be expected that they would indulge in non-price rivalry in order to attract more business towards them (see also Owen (1977); Scherer (1980); and Stigler (1964)). This tendency would be stronger if the collusive price is set much above the competitive rate. Much of promotional campaigns which are directed to attract listings (from the already given stock of listings) would have questionable social value. Of course, a part of those expenses (eg. more informational ads in newspapers) which are directed to obtain buyers may improve service quality (eg. better matches). Given the dichotomous way brokerage fees are assessed, buyers would tend to utilise brokerage services anyway (only to be constrained by his search costs for brokers, which may be very small under MLS). As a result, it is very likely that a major part of promotional expenses would be designed to attract listings rather than buyers.

The following predictions can now be stated:

Proposition III: If price collusion alone is achieved, brokers would tend to indulge in substantial non-price rivalry. A part of this non-price rivalry may improve service quality, but another part of it may have questionable social value.

Proposition IV: With relatively easy entry, a high commission rate would encourage excessive entry and would allow some inefficient firms to survive. Entry will continue until excess profit is exhausted.

Given Propositions III and IV, one should not be surprised to observe low profit rates in easy entry collusive industries. Asch and Seneca (1976), for example, find that collusive behaviour is inversely related to inherent firm profitability. For the Vancouver brokerage market, Rosenbluth (1976; pp 37-47) found that, in spite of high commission rates, the earnings of brokers and salesmen were not much higher than other industries (eg. mining and manufacturing). Observing low profit rates, some researchers have been tempted to characterise such industries as purely competitive (see Case (1965); Kalymon[17] (1978)) or monopolistically competitive (see Becker (1971)).

3.4.3 Cost/Difficulty of Coordination in the Brokerage Industry

Collusion might be formal (eg. a bylaw of the real estate board) or implicit (as occurs under price leadership or focal point pricing). If collusion pertains in the brokerage industry, the objective of the cartel would be to maximize joint industry profits. Price (commission rate) would be set for both the ELS and MLS transactions such that the respective profit functions (equations (3.8) and (3.9) respectively for the ELS and MLS cases) are maximized (these equations now being interpreted at the industry level).

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[17] Strictly speaking, Kalymon's study refers to real estate builders and developers rather than to real estate brokers.

This section would argue that significant rewards for cheating (discounting) together with structural features render collusion, if it exists, very unstable in this market.[**] It will be demonstrated that the net incentive to cheat is especially strong due to the following structural features: (a) a large number of firms; (b) the presence of external firms (non-members and potential new entrants); (c) the presence of a high proportion of small firms; and (d) the high rate of entry of new customers/home owners (demanding brokerage services) per period of time.

The role of the above factors are discussed using the methodology developed by Stigler (1964). In his classic article, Stigler provides important insights about cartel behaviour and its organization. More specifically, he emphasized important difficulties associated with the policing of cartel arrangements. His implicit analytical framework can be used to make inferences regarding the circumstances under which a cartel organization would be less susceptible to secret price-cutting and hence more stable. This methodology is modified (eg. the assumption of equal firm sizes is dropped), extended (eg. additional new results are obtained), and then applied to a study of the price discounting behaviour of the brokerage industry.

[**] Discounting may occur at the time of listing or at the time of sale.

For subsequent analysis, two groups of customers are identified: (a) current customers (home owners) who want to renew their listing contracts (their properties are still unsold); and (b) customers who are new in the market. Assume there are C customers of which C_0 are current and C_n are new. Consider the behaviour of current customers first (ignoring new customers for the time being, i.e. $C = C_0$). Many current customers recognize the advantages of renewing the listing contract with the same broker, thereby avoiding the transaction costs of finding another broker and signing another listing contract, as being greater than the benefits of possible discounts that may come from changing brokers.''

Assume that there are N brokers in the market. Given any arbitrarily defined time period over which listing contracts are signed, assume, for simplicity, that all contracts expire at the end of the period and that all contracts are renegotiated and renewed/recontracted at the beginning of each period. Let s be the probability that a customer will be attracted to a broker. Thus s can be interpreted as his market share in the previous period. Since price exceeds marginal cost (under collusion), an individual broker would have a strong incentive to obtain a market share exceeding s by giving secret price discounts. From the pool of customers, he will be able to obtain, on

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'' Some customers may want to switch if they view their current brokers as highly inefficient.

average, m listing contracts[19] in the absence of secret price discounts, where m is given by:

$$m = C_0 . s = C . s \qquad (3.12)$$

and has a standard deviation

$$v = \{ C.s.(1-s) \}^{1/2} \qquad (3.13)$$

With collusion, the commission rate is given for a cartel member. A broker may offer secret discounts to some customers (with a maximum value of the excess of price above marginal cost) in order to attract more than m contracts. Assume that he can obtain a number of contracts which is k (any positive number) standard deviations above m without being deemed a price-cutter by its rivals (the deviation within that range may be viewed as due to random factors). A similar condition holds for other rivals as well. Thus, a broker will be suspected of price-cutting only if he obtains more than (m + k.v) contracts. Since this reflects the maximum contracts a price-cutting firm can obtain without being deemed a price-cutter, and since m is the expected number he can obtain without price cutting, one can define G as follows:

$$G = (m + k.v - m) = k.v \qquad (3.14)$$

where G can be interpreted, following Stigler (1964), as the gain in sales with price-cutting remaining undetected. Expressing G as a proportion of his own average sales m, the following is obtained:

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[19] A binomial probability distribution is assumed. Here s is the probability of success in attracting customers and (1-s) is the probability of failure.

$$PG = k.\{C.s.(1-s)\}^{1/2}/C.s \qquad (3.15)$$

where PG expresses the maximum proportion of listing contracts which can be gained by secret price-cutting, beyond which rivals would infer price-cutting. Since the profitability of secret discounting depends partly on the the number of customers one obtains, PG can also be interpreted as proxying the incentives to engage in secret price discounts (see Stigler (1964)).

Taking a partial derivative of PG w.r.t. s, and simplifying the expression, the following is obtained:

$$\partial PG/\partial s = -(1/2).k.C^{1/2}.\{(1-s)/s\}^{-1/2}.(1/s^2) \qquad (3.16)$$

Since $\partial PG/\partial s$ is negative, the following predictions can be derived:

Proposition V: The incentive to secret price-cutting (or equivalently the difficulty of detecting secret price cuts) is inversely related to s (i.e. size of the firm).

The implication of this proposition is that smaller cartel members would offer commission rate discounts more frequently than the larger firms. This result is consistent with general cartel theory (an explanation of this hypothesis is given in Chapter 4, section 4.1 below).

Turn now to examine the effect of N (number of firms) on incentives for secret price cutting. Equation (3.15) cannot be used for this purpose because N does not appear explicitly in this equation. To overcome this problem, G (equation 3.14) is expressed as a proportion of mean market share in the industry (1/N) (instead of m as in equation (3.15)) and the following equation is obtained:

$$PGG = k.N.\{C.s.(1-s)\}^{1/2} \tag{3.17}$$

The interpretation of PGG is similar to PG, i.e. it can be interpreted as the maximum proportion of listing contracts (expressed now as a proportion of average market share (1/N) instead of m) which can be gained by secret price-cutting. Differentiating equation (3.17) w.r.t. N and simplifying the expression, the following equation is obtained:

$$\partial PGG/\partial N = k.\{C.s.(1-s)\}^{1/2} \tag{3.18}$$

From equation (3.18), where $\partial PGG/\partial N > 0$, the following proposition can be stated:

Proposition VI: The incentive to secretly price discount (or equivalently the difficulty of detecting price cuts) varies directly with the number of firms in the industry. This proposition holds for both the ELS and MLS transactions. Again, this proposition is quite consistent with the received theory of the cartel. As discussed in section 3.5.1 above, an increase in the number of firms increases coordination costs (increases policing and enforcement costs by exacerbating the detection problem (see also Scherer (1980); and Stigler (1964)). Given that most brokerage markets contain a large number of firms, and entry is relatively easy (see Bartlett (1981); Owen (1977); Rosenbluth (1976); Yinger (1981)), it can be argued that a brokerage cartel would face enormous coordinational difficulties, especially in the ELS market.

The previous discussion ignores the entry of new customers in the market each period. Note that entry of new customers may play a significant role in this market. In each period, many home owners enter this market for the first time to sell their homes. This factor may have strong influence on the discounting behaviour of brokers. Assume, for simplicity, that the number of new customers, C_n, per period is a constant proportion ω of C_0, i.e.

$$C_n = \omega . C_0 ; \; 0 < \omega < 1 \tag{3.19}$$

where ω is the rate of entry of new customers. A broker will be able to attract, on average, m_n of these new customers:

$$m_n = C_n . s = \omega . C_0 . s \tag{3.20}$$

with a variance

$$V_n = \omega . \{C_0 . s . (1-s)\}^{1/2} \tag{3.21}$$

and the relevant expression for PG_n, the maximum undetected proportionate gain in the share of new customers attributable to discounting, is:

$$PG_n = k.\{\omega.C_0.s.(1-s)\}^{1/2}/(1+\omega).C_0.s \qquad (3.22)$$

where the denominator in equation (3.22) represents the firm's market share after taking account of new customers.

Taking the partial derivative of equation (3.22) w.r.t. ω and simplifying the expression, the following result is obtained:

$$\partial PG_n/\partial\omega = K.\{(1-s)/C_0.s\}^{1/2}.\ \{(1-\omega)/2\omega^{1/2}.(1+\omega)^2 \qquad (3.23)$$

Equation (3.23) is positive for $s<1$ and $\omega<1$. The following prediction can be derived:

Proposition VII: The incentive to secretly price-cut (or equivalently the difficulty of detecting price cuts) is positively related to the rate of entry of new customers ω per period of time (see also Stigler (1964)). Since it is less likely to result in the detection of cheating, brokers are more willing to offer discounts to attract new customers by offering discounts to them rather than to the current customers of rival firms. This result holds for both the ELS and the MLS market. Note that ω is relatively high for the brokerage industry *vis-a-vis* other industries. This is because the housing market is characterised by transactional infrequency. As a result, the turnover of home owners and buyers is large. Each period, many new listings appear in the market and a large proportion of old listings disappear from the market. Firms in this market thus have ample opportunities (and therefore incentives) to engage in secret discounting with less fear of being detected relative to that in other collusive markets characterized by a smaller rate of turnover of customers.

3.4.4 Conditions Facilitating Collusion in the Brokerage Market

The above propositions indicate the existence of strong incentives for secret price cutting by brokers. The incentives would be stronger, the greater the excess of collusive price over competitive costs. Given these incentives, the following prediction can be made:

Proposition VIII: In a collusive brokerage market, a non-trivial dispersion of actual transaction prices would prevail because of possible secret price-cutting by brokers. But, in contrast to Proposition I, price dispersion in this case would be observed *below* the cartel determined commission rate (call it the "ceiling rate").

Although a brokerage cartel is potentially unstable, certain factors contribute to its stability. The major hypothesis is that the cartel difficulties can be overcome (and hence the cartel stabilized) if the institutional arrangements inherent in the MLS system are effectively used by the brokerage trade association to detect and deter cheating. The coordination and enforcement costs can be significantly reduced in spite of a large number of firms, relatively easy entry of firms, the presence of a high proportion of small firms, and a high rate of turnover of customers in this market.

With a view to analysing the stability question, one can begin by comparing the institutional arrangements underlying the ELS and MLS transaction processes. In the ELS market, the market share of individual members is generally unknown, as is the price charged by them. Thus, the detection, deterring , sharing and location problems are more difficult to solve. The existence of external firms accentuates this dilemma. Collusion in the ELS system falls under case III or case IV above (section 3.4.1) and, therefore, is less likely to be stable. One important implication of this result is that a high degree of price cutting would prevail if collusion is organised in the ELS system.[71] It is to be mentioned here that collusion, nonetheless, can be facilitated by the existence of a focal point (such as the 6 percent value provided by the pre-1976 commission rate).

In contrast to the ELS, it is argued that price collusion is better achieved and maintained in the MLS system, largely due to the institutional mechanisms underlying the MLS process. In Chapter 2, it was mentioned that the MLS system has a greater potential for generating an informationally efficient transaction process than the ELS system. In this section, it is argued that the scope for the market application of this potential is greatly reduced when the MLS is used as a cartel coordinating device. As a matter of fact, the MLS provides firms with an excellent institutional mechanism through which price coordination can be achieved and maintained at a reasonably low cost. To see this, recall the transaction process underlying the MLS system. Under the MLS, the listing broker sets the commission rate and also specifies the "split" or the commission sharing parameter[72] (usually 50-50).[73] Moreover, under current MLS practice he must allow all participating members access to the information on commission rate and "split", and other listing information through the MLS listing catalogue.

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[71] It is to be recognized that salesmen and broker training may also promote adherence to the established rate.

Other listing information includes various characteristics of the house, the list (asking) price of the house and the identity of the listing broker. In the Edmonton brokerage market, for example, the information on the commission rate and the "split" is recorded under the "CODE" in the listing catalogue. In addition, when the house is sold, the final sale price of the house and the identity of the selling broker (which may be different than the listing broker) are also published in the MLS sales catalogue. The information on commission rates and market shares facilitates the solution of the detection, deterring, sharing and location problems and thus facilitates cartel stability. In terms of earlier categorisation, the MLS market falls under case I where collusion is likely to be highly successful (see also Owen (1977; p 948). Even in markets where commission rate information is not published, increases in a particular firm's market share beyond an acceptable limit raises suspicion of his price cutting, and retaliatory price cutting reduces his incentives to cheat in the first place.

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[72] It would be interesting to find out from a micro model what factors determine the optimal value of β from the point of view of the listing (selling) broker and how likely it is to be 50-50. This issue will not be pursued here.

[73] The listing broker pays the MLS fee from his share of commission on a pre-specified basis.

In addition to the above mentioned deterring and detection problems, other factors inherent in the MLS mechanism also contribute to price stability. One factor already mentioned earlier is the simultaneous fixing of both commission rate and the "split", which reduces the incentives to discount/cheat compared to a situation where only one of them is fixed. This point can be clarified with an example. Assume that the house selling price is $100,000, the MLS fixed commission rate is 7%, and the split is 50-50. If both the listing broker (LBR) and the selling broker (SBR) observe MLS regulations, each receives a commission[74] of $3500. Assume now that the LBR cheats by charging 6% instead of 7%, but does not disclose it to the SBR. The SBR, who observes the MLS regulations, will again receive $3500 but the commission of the LBR would be reduced to $2500 ((6% of $100,000 - (0.5 of 7% of $100,000)). Note that the possibility of the LBR absorbing the effect of price cut is ignored by Bartlett. This example also shows , contrary to Bartlett, that the selling broker's incentive to sell the properties which do not bear "full" commission may not be reduced because the price cut, if any, is absorbed by the LBR.[75]It is to be noted that given a fixed "split", the percentage share of commission received by the LBR would decline rapidly with the degree of price cutting.[76]

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[74] Out of its share, the listing broker pays the MLS fees.

One objective of the example was to show that the outcome could be different, i.e. incentives for secret price cutting could be preserved, if the "split" was negotiable between the LBR and the SBR in each transaction, even though the MLS would still fix the commission rate. For example, if the split was negotiable, the LBR in the above example could secretly cut the commission rate to 6% and at the same time negotiate to reduce the share going to the SBR in such a way that the former could shift a part of the effect of price cutting on to the SBR. As a result, the LBR alone would not have to absorb the full effect of discounting/cheating.[77]

Thus if the "split" is allowed to vary, there would be incentives for an individual listing broker to secretly cut price and thereby undermine the stability of the collusion. In other words, the fixing of the "split" along with the commission rate has a significantly negative impact on price competition in the MLS system. But even though a negotiable split system would be more conducive to price cutting, price competition would still be minimal so long as members are required to disclose information on the commission rate in the MLS catalogue.[78] Thus, given the institutional framework inherent in the MLS process, a negotiable "split" alone would not generate a significant pro-competitive effect.

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[75] In this case, the LBR's commission of $2500 constitutes only 42% of the actual realised commission, the 58% going to the SBR even though a split of 50-50 is known to the SBR and the MLS.

[76] Using the same example, if the LBR cuts the rate to 5% (instead of 6% in the above case), his actual share would be 30% ($1500 out of $5000) and the remaining 70% going to the SBR. Thus fixing both the price and the "split" would impose large penalties and ,therefore, serious disincentives for the LBR to cut price.

[77] For instance, if β on the nominal commission rate of 7% could be reduced by negotiation from 0.5 to 0.43, the actual share of both would be equal ($3000 each) without the SBR knowing that price cutting has taken place.

Other factors that may contribute to the success of MLS collusion can also be summarised. First, the abiding members may refuse to sell, thereby boycotting (or showing less interest in selling) the listings of the price cutting members. This deterrence becomes stronger the greater the proportion of sales channelled through the MLS process. Such actions may impose serious financial loss on the price cutting firm and may even threaten its survival (see also Owen (1977)). Second, it can be predicted that the external firms are more likely to cut prices than member firms. The external problem is minimised by the fact that participating non-members are not allowed to determine the commission rate (since they are not allowed to list their properties in the MLS catalogue and that only members set commission rate on these transactions). Third, the manner of training salesmen and the requirement that salesmen must serve an "apprenticeship" with an existing agent before becoming agents themselves may also create inertia in commission rates.[17]

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[78] It can, of course, be argued that the price cutting firm could always report the standard rate while , in practice, the broker is actually receiving a lower rate. But this would require rather elaborate falsification of relevant papers such as the listing agreement or the documentation in the MLS listing/sale catalogues. These would provide additional disincentives for secret price cutting.

But the question remains that the non-members can still cut prices on the non-MLS properties and thereby destabilise the cartel. Again, this is usually not a serious problem because of the fact that, in most brokerage markets, the non-members as a percentage of all firms is very small (less than 25 percent in Canada; see Appendix E, Table E.5) and the proportion of MLS sales achieved by the non-members even smaller. Note that, although non-members participate mainly in the ELS transactions (an estimate of their share *vis-a-vis* members in this market is not known), their combined market share of MLS sales in 1981 was found to be less than 2 percent. Thus the external firms usually do not pose a significant threat. Third, local real estate boards to some extent restrict entry through membership regulations and various other restrictive practices such as higher educational requirements[18] (over and above government licensing requirements), codes of ethics and standards of business practices.

Fourth, with the MLS, there is a conscious attempt towards service standardisation. Such standardization may be an attempt to reduce non-price (especially quality of service) rivalry (see also Bartlett (1981); and Owen (1977)). Service standardization is more easily achieved with MLS transactions relative to ELS transactions. This is because under the the former, brokers can pool information. Therefore, any member broker can provide a client with the same information as other competing members. As a result, service quality is more standardized. But 'quality competition' can still persist even in MLS transactions because some brokers can apply greater selling efforts or put more informational ads in newspapers than other brokers. The latter efforts can increase the speed of closing a transaction or achieve a better match for home buyers and sellers.

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[17] Note that salesmen training courses are provided by the real estate boards.

[18] As discussed in a previous footnote, salesmen and broker training (which are usually provided by the real estate boards) may promote adherence to established rate.

Real estate boards usually argue that service standardization is pursued to with the objective of "protecting" the interest of home buyers and sellers. But in a few studies, product/service standardization has been identified as an activity in restraint of trade.[illegible] Further, the MLS , being operated by an association of brokers, is more likely to protect the interests of the brokers rather than the consumers. Finally, it is the purchasers of brokerage services (say home owners) who should decide , in an actual market situation, the quality and quantity of service they want to purchase rather than the MLS deciding on their behalf. If home buyers and sellers are allowed to

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[illegible] See Telser (1960), p 90 for details.

decide the quality and quantity of services they want, one would observe services of different quality and quantity being provided at different prices/commissions (which would reflect the minimum costs of production).

From the above comparison of the ELS and MLS cartels, it is now possible to derive a few additional testable predictions. If a firm offers secret price cuts to a customer, there is some probability p (however small) that some rival will detect one such price discount. Then (1-p) is the probability that rivals will not detect it. If the firm gives discounts to t customers, $(1-p)^t$ is the probability (assuming independence) that he will not be detected. Then, the probability that the broker would be detected for at least one such discounts (call it PD) when he offers discounts to t customers is given by the equation:

$$PD = \{1-(1-p)^t\} \tag{3.24}$$

Taking a partial derivative of PD w.r.t. t, one obtains:

$$\partial PD/\partial t = -LOG(1-p)(1-p)^t \tag{3.25}$$

This equation is positive since LOG(1-p) is negative (given that p lies between zero and unity). The following prediction can be derived:

Proposition IX: The probability of detection PD increases with the number of secret discounts given by a firm.

One implication of this proposition is that, under a uniform fixed commission structure, a firm may be more inclined to give secret discounts to those home owners offering more expensive properties for sale.[82] This is because, given cost, under a uniform fixed percentage commission structure, the excess of price over cost is larger for the more expensive properties than less expensive ones. As a result, brokers would be more interested to attract a greater share of the more expensive properties by offering secret discounts. Thus, the following prediction can be made:

Proposition X: Collusion is likely to be more effective against less expensive properties while it is less effective against more expensive properties (see also Stigler (1964)). Thus, secret discounts would be offered less frequently (and by a smaller amount if a discount is given at all) to home owners with less expensive properties. Some evidence on this issue can be provided from the commission rate information provided by Rosenbluth for the Vancouver market.[83] An analysis of his data suggests that price competition is weakest in the sale of low-priced properties relative to the high-priced properties. For example, he reports that the proportion of sales at less than the previously fixed rate

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[82] Stigler (1964), for example, argues that oligopolists adhere to the agreed-upon price while selling to small retailers even though they are cutting prices to larger chain stores and industrial buyers.

[83] Note that Rosenbluth did not recognize the importance of this information in explaining brokerage price stability against more expensive properties.

(7 percent) is 41 percent for properties valued between 50,000 to 100,000 dollars, while it is only 22 percent for properties valued less than 50,000 dollars. This evidence is consistent with the predictions of the collusive model. One may of course argue that this scheme reduces (but does not eliminate) the severity of discrimination and hence reflective of a competitive market structure. The latter argument is not very convincing because of the fact that only a single break point has been observed over a long period of time. In a competitive environment, more than one break point would have occurred and, at the same time, traditional break point would have changed with cyclical/long term changes in the housing market.

In order to discourage frequent discounts on expensive properties, one response would be to fix a lower commission rate on those more expensive properties. This would, of course, require defining many transaction classes (eg. on the basis of property values) on which different rates would apply. But defining many transaction classes would enhance coordination/monitoring costs. Considering this factor, brokerage cartels have usually adopted a two-block (instead of a multi-block) scheme in which a 6/7% commission rate applies for the ELS/MLS transactions on property value up to $100,000 and a marginal rate of 3% on value in excess of $100,000. Rosenbluth's data can again be used to show that the declining two-block scheme, although reducing the severity of price discrimination, facilitates price stability against more expensive properties. For example, it is observed that the proportion of properties sold at a discount rate was 38 percent for properties valued in excess of 100,000 dollars, while the corresponding proportion is 41 percent for properties valued between 50,000 to 100,000 dollars. If this scheme were not adopted, more discounting frequency would have been observed for the above 100,000 dollar properties.

Turning again to equation (3.24), the differentiation of PD w.r.t. p, results in the following:

$$\partial PD/\partial p = t.(1-p)^{t-1} \tag{3.26}$$

In equation (3.26), $\partial PD/\partial p$ is positive, i.e. the probability of detection (PD) increases with p. Using this result and noting that p and therefore PD depends on such factors as: (a) whether the transaction is an ELS or an MLS one; (b) whether the broker involved is a member of the cartel group; and (c) whether the broker involved is a large firm, the following predictions can be derived. Consider (a) first. If collusion pertains in both the ELS and the MLS market, probability of detection (PD) is significantly higher for MLS than ELS transactions (as discussed above). This result gives rise to the following proposition:

Proposition XI: Secret discounts would be more frequently observed in the ELS than in the MLS transactions.

On average, p and therefore PD would be higher for members than for non-members. This gives rise to the following hypotheses:

Proposition XII: Members would discount less frequently than non-members for both ELS and MLS transactions (this proposition needs modification as discussed in section 4.1 of Chapter 4 below).

The probability of detection is likely to be higher if discounts are offered by a large firm than a small firm (since discounting by the former is more easily detected). Given this, one may observe the following:

Proposition XIII: smaller firms would give secret discounts more frequently than larger firms. This proposition would hold for both the ELS and the MLS transactions. Note that this hypothesis is consistent with Proposition V above.

3.4.5 Cyclical Variation in Brokerage Pricing

Without developing any formal model, Bartlett argued that the brokerage price would move in a counter-cyclical fashion. It is shown in Appendix B that his analysis suffers from serious limitations. In this Appendix, it is also shown (using the non-collusive model) that the direction of price movement cannot be unambiguously predicted (since the direction and extent of price movement would depend on the relative shifts in the demand and cost conditions in the market in response to cyclical changes in the upstream housing market). From the collusive model, however, different predictions are forthcoming. Once a price is fixed, it would require intense negotiation to reach another agreement concerning price. Negotiation costs would be higher the larger the number of participating firms with different price/output preferences. Further, firms may realise that a frequent change in the price structure would not be conducive to cartel stability.[44] In addition, a uniform price can act as a focal point of coordination which reduces coordination costs and enhances price stability. As a result, brokers may prefer to adhere to the existing price structure during a period of recession/boom in the housing market. The following may be observed:

Proposition XIV: With successful collusion in the brokerage market especially in the case of MLS transactions, it is expected that the price/commission rate is likely to remain insensitive to cyclical changes in the upstream housing market.

3.4.6 Cyclical Variation in the Commission Sharing Parameter

It was discussed in section 3.6.4 above that the fixing of this parameter β along with the commission rate can play a crucial role in discouraging price competition. It can be argued that if the value β were to reflect the relative costs of obtaining listings *vis-a-vis* buyers, then its value would tend to increase during a period of depression (since buyers are more difficult to obtain than listings) and decrease during a period of boom (when buyers are more readily available). In other words, a cost-based value of β might move in a counter-cyclical fashion in response to changes in the upstream housing market.

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[44] This might explain why brokers (with market power) do not follow the discriminatory two-part pricing scheme which may require periodic cyclical/ inflation adjustment in the fixed fee component (F) under this scheme. A frequent change in F may increase coordination costs and contribute to instability.

However, a different prediction is forthcoming from a model of collusion. Instead of a variable β, one may now observe a stable value of this parameter (over time) if it is the result of a process of collusion. This is because, as in the case of the cyclical stability of brokerage price, once a value of β is collusively determined, members may prefer not to change it because of possible large negotiation costs involved in arriving at a new agreement acceptable to all members. This cost is again higher the larger the number of participating firms involved and the greater the differences among brokers with respect to specific preferences for β during different time periods. In addition, a fixed β may act as a focal point of coordination which reduces coordination costs and enhances price stability. Finally, it is already argued that a fixed price along with a fixed β significantly reduces incentives to price cutting by individual members. One prediction thus follows:

Proposition XV: Under a regime of effective collusion, commission sharing parameter is likely to be insensitive to cyclical changes in the upstream housing market.

The next chapter is devoted to empirical testing of some of propositions (depending on data availability) related to brokerage pricing behaviour, while Chapter 5 devotes attention to empirical testing of propositions related to non-pricing behaviour.

4. EMPIRICAL EVIDENCE ON BROKERAGE PRICING BEHAVIOUR

The purpose of this chapter is to examine the nature and determinants of brokerage pricing behaviour using observed data for the Edmonton market. The analysis assesses the relative predictive power of the non-collusive and the collusive models and so provides an indication of the effectiveness of Canadian competition policy in stimulating price competition in this market. The scheme of the chapter is as follows: Section 4.1 discusses some predictions of the models which are subject to empirical testing in section 4.2 using observed data on MLS and ELS commissions. Section 4.3 provides some additional evidence on the effect, if any, of Canadian competition policy on brokerage conduct while section 4.4 summarises this chapter.

4.1 PREDICTIONS OF THE NON-COLLUSIVE AND COLLUSIVE MODELS

This section reviews some of the hypotheses/predictions (derived in Chapter 3) which are subjected to empirical testing (depending on data availability) in this chapter. First, as discussed in Chapter 3, a model of collusion predicts a stable commission structure (around a single dominant rate). The dominant rate may act as a focal point of oligopolistic coordination (see Scherer (1980); Schelling (1960)). Any price dispersion observed below that ceiling price would reflect the degree of price cutting (commission discounts) by some cartel members (Proposition VIII). In contrast, a non-collusive model predicts (Proposition I) that a price dispersion would be observed above some floor price which reflects the minimum costs of production (see Chamberlin (1933); Bartlett (1981); and Salop and Stiglitz (1977)).

Second, if collusion pertains in the brokerage market, one would predict lower discounting frequency (lesser degree of price cutting) in MLS than ELS transactions (Proposition XI). The following considerations lend support to this prediction. (i) the MLS sale may involve a different listing and selling agent, and since the former usually sets the commission rate and its split, he will be more careful in an MLS transaction to adhere to the standard rate and the split which are maintained by larger brokers; (ii) the commission rate on an MLS listing is printed clearly in the MLS listing form (as the "CODE") and so secrecy is impossible in MLS transactions; (iii) the MLS catalogue publishes the identities of both listing and selling brokers and therefore the implied market shares of individual brokers and any increments over time, which in turn facilitates the detection (and deterrence) of cheating; (iv) in cases where an exclusive listing at low commission rates does not result in a sale, a subsequent resort to the MLS calls for a new listing agreement, and so the carry-over of any discount from the exclusive to the MLS commission rate is unlikely.

Third, if collusion pertains, it is likely that larger firms would cut prices less frequently than smaller firms since (Proposition XIII) the former may act as price leaders in setting and maintaining the coordinated price structure, and any attempt by them to cut prices is easily detected (since close rivals would monitor their sales) and, if met with retaliation, reduces the stability of the cartel. On the other hand, price discounting by smaller firms may easily go undetected. Even if detected (it is made easier under MLS), other firms may not retaliate so long as their market shares are not seriously threatened.

Fourth, presuming collusion, further tests can be performed to examine the price discounting behaviour of member and non-member firms. In general, cartel members are likely to discount less frequently than non-members (Proposition XII). But, in the case of brokerage industry, this proposition may not hold for the MLS market. On the one hand, it might be expected that non-member firms would discount more frequently than member firms, the latter being under greater compulsion to adhere to the commission rate norms as well as the formal regulations of the board. However, this may not be the case for MLS transactions since non-members may sell but not list on the MLS and hence cannot determine the *ex ante* MLS commission rate. Nor might more discounting by non-members be observed for ELS transactions since both members and non-members can rely equally upon secrecy to avoid disclosure of ELS commission rates and discounts. Hence little difference in the discounting behaviour of members/non-members may be observed for both ELS and MLS transactions.

Fifth, price will be usually expressed in terms of a uniform commission rate (eg., 7%) rather than (say) a fixed fee (eg. $1000) plus a percentage incentive bonus (eg. 15%) on the excess of sale price over appraised property value. As explained in Chapter 3 above, this practice may be potentially price discriminatory and hence reflective of monopoly power/collusion. Note also that brokers may adopt a declining two-block scheme (which reduces but does not eliminate the severity of price discrimination) which facilitates collusion against more expensive properties (Proposition X). In addition, if collusion pertains, the commission rate is likely to be less sensitive to cyclical changes in the upstream housing market (Proposition XIV).

Sixth, if collusion pertains in determining the commission sharing parameter, the value of β would remain stable over time (Proposition XV). This is because a frequent change in β not only imposes substantial negotiation costs on brokers, but more importantly, potentially undermines cartel stability.[85]

Finally, with easy entry, the relatively high commission rate maintained by oligopolistic coordination may encourage excessive non-price rivalry especially to obtain listings and buyers through prolonged search (Proposition III), and excess capacity in the form of underemployed salesmen and facilities.[86] The last issue is addressed in more detail in Chapter 5 below, while other issues are taken up in this chapter for empirical verification.

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[85] Note that a stable β may also be consistent with a model of non-collusive behaviour if brokers try to minimize transaction costs associated with the determination of β.

[86] See Islam and Jenkins (1983), p 4.

4.2 COMMISSION RATES UNDER THE ELS AND THE MLS SYSTEM: SOME EMPIRICAL EVIDENCE

This section presents an analysis of the observed structure of commission rates. The results provide tests of various hypotheses/predictions discussed in the previous section. The data were compiled from an extensive questionnaire survey of 161 brokerage firms in the Edmonton metropolitan housing market in 1979. Additional firm specific data on commission rates for MLS transactions are collected from the MLS sales summaries (monthly issues). These latter data permit an analysis of the time profile of price discounting behaviour in this market.

The frequency distribution of the commission rates reported in the questionnaire survey for the MLS system is given in Table 4.1 and that of the ELS system in Table 4.2. As already discussed, within the framework of a collusive model, any rate dispersion would lie below the dominant ceiling rate; also the greater is the success in maintaining coordination, the smaller would be the expected dispersion. In Table 4.1, it is observed that the modal rate in the MLS transactions is 7%, the same as during the pre-1976 era of formal collusion (when official discounting was absent). In this case, 50.9% of the brokers charged a precise 7% commission rate while another 33.5% charged a rate between 6

TABLE 4.1: Frequency Distribution of Commission Rates for MLS Transactions

Commission Rates	No. of Firms	% of Firms	Cumulative % of Firms
Less than 5%	2	1.3	1.3
5 - 6%	17	10.6	11.9
6 - 7%	54	33.5	45.4
Exactly 7%	82	50.9	96.3
Above 7%	2	2.5	100.0
Total	161	100.0	-----

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

TABLE 4.2: Frequency Distribution of Commission Rates for ELS Transactions

Commission Rates	No. of Firms	% of Firms	Cumulative % of Firms
2 - 4%	13	8.1	8.1
4 - 5%	20	12.4	20.5
5 - 6%	47	29.2	49.7
Exactly 6%	60	37.3	87.0
Above 6%	17	10.6	97.6
No response	4	2.4	100.0
Total	161	100.0	-----

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

and 7%. Only 1.2% of the brokers charged rates above 7% while 1.3% charged below 5%. Thus there appears to have been a strong tendency towards price uniformity at a ceiling rate and a limited dispersion (*below* that rate) attributable to coordination.

Interestingly enough, a similar pricing structure is also observed in the ELS transactions (Table 4.2). The modal rate in this case is 6%, which is one percentage point lower than the MLS modal rate and the same as during the pre-1976 period of formal collusion. Some 37.3% of the brokers charge exactly 6% and another 29.2% charge betweeen 5 and 6%. It is evident that there is a similar structure but slightly more dispersion (statistical tests are given below) of the commission rate in the ELS than in the MLS case.

The lower average rate of commission and its greater dispersion in the ELS than in the MLS case is also evident from the summary statistics (mean, standard deviation and coefficient of variation) provided in Table 4.3 for the total sample as well as three size classes.[8] Table 4.3 clearly shows that the mean ELS rate is lower than the MLS rate (for the total sample as well as three groups) by a margin of approximately one percentage point. Applying an appropriate z-test (standardized normal test), the null

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[8] The classification of firms into three groups is made on the basis of the number of salesmen employed. The small firms employ less than 5 salesmen, medium firms between 5 and 10 salesmen and the large firms employ more than 10 salesmen. An alternative classification of firms into three groups on the basis of the average number of houses sold were also tried. The results from the two classification schemes were similar.

TABLE 4.3: Commission Rates for MLS and ELS Transactions: Summary Statistics

Statistics		All Firms	Small Firms	Medium Firms	Large Firms
Mean	MLS	6.57	6.44	6.72	7.00
Mean	ELS	5.53	5.37	5.74	6.00
SD	MLS	0.67	0.75	0.50	0.00
SD	ELS	0.69	0.75	0.49	0.20
CV	MLS	10.20	11.70	7.40	0.00
CV	ELS	12.50	14.00	8.50	3.30
responses	MLS	142	90	38	14
responses	ELS	139	90	35	14

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

hypothesis of no difference in the mean ELS and MLS commission rate was rejected (at 1 percent level of significance using a two-tailed test) for samples of all, small, and medium firms. Applying a t-test for the sample of large firms (a z-test could not be applied due to the small size of the sample), the null hypothesis was also rejected at the 5 percent level of significance.''

Turning now to the dispersion of commission rates for all agents, it is observed that the dispersion of the ELS rate is slightly greater than the dispersion of the MLS rate (probably due to the greater secrecy associated with ELS transactions). The statistical significance of the implied difference in acknowledged price discounting by firms for ELS and MLS transactions can be tested by applying a chi-square test.'' A 2 by 2 contingency table is constructed

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''The calculated z and t values for the total, small, medium, and large firms are respectively 12.3, 9.6, 8.4 and 2.5.

''Alternatively, an F-test (based on the ratio of variances) could be performed. Applying this test, the null hypothesis of no difference in the dispersion of ELS and MLS transactions could not be rejected even at 10 percent level for any group except for the large firms (the calculated F-values were 1.06, 1.0, and 1.04 respectively for the total sample, small, and medium firms). But for the large firms, the null hypothesis was rejected at 1 percent level (the F-value being infinitely large). Note that this test is not very accurate for the following reasons. First, the requirement of transforming discontinuous data (from a questionnaire survey) into continuous form (using mid-values) introduces serious bias (eg. over-representation of small firms' discounting behaviour). Second, this test requires that the populations from which the two samples were drawn have roughly the shape of normal distributions. In contrast, the chi-square test can be applied even with nominal level data (i.e. data transformation is not required). Another advantage of this test procedure is that it is free of any assumptions regarding the distribution of the parent population.

(Panel A of Table 4.4) on the basis of whether brokers discounted for ELS and MLS transactions. The Chi-square test is performed on the null hypothesis of no stated difference in the discounting behaviour of ELS and MLS transactions. With one degree of freedom, the calculated Chi-square value of 7.7 permits the rejection of the null hypothesis at the 1 percent level.

From Panel B and C of Table 4.4, it is also observed that 9.4% and 20.8% respectively of the 149 responding ERB members implied that they discounted MLS and ELS transactions by a full percentage point or more. On the other hand, 25.0% and 37.5% respectively of the 8 responding non-members were discounters. Again, to test the statistical significance of the observed differences, the Chi-square test is repeated separately for the ERB members and non-members.[10] For non-members, the null hypothesis could not be rejected even at 15% level (chi-square value is 0.30) while, for members, it is rejected at 1% level (chi-square value is 7.56). The above observations are also more consistent with the predictions of the collusive than the non-collusive model. As already explained, the MLS system permits a higher degree of price stability than the ELS system. This is mainly because the detection and deterrence of cheating is easier in the case of the widely publicized

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[10] For non-members, the test procedure is not very accurate because two of the cell frequencies were less than 5. For this and other cases below, Yate's correction for continuity (see Richmond (1964), pp 301-302 for details) was applied, where appropriate, in calculating the chi-square values.

TABLE 4.4: Price Discounting in the ELS and MLS Transactions, 1979.

Panel A. Price Discounting: All Brokers

	MLS	ELS	Total
No. of Firms Discounting	16	34	50
No. of Firms Not Discounting	141	123	264
Total	157	157	314

Panel B. Price Discounting: Non-Members

	MLS	ELS	Total
No. of Firms Discounting	2	3	5
No. of Firms Not Discounting	6	5	11
Total	8	8	16

Panel C: Price Discounting: ERB Members

	MLS	ELS	Total
No. of Firms Discounting	14	31	45
No. of Firms Not Discounting	135	118	253
Total	149	149	298

Source: Adapted from Tables 4.1 and 4.2.

MLS transactions whereas they are made difficult by the secrecy of ELS commission rates and discounts.

Attention is now devoted to another aspect of pricing behaviour: the relation between the commission rates and firm size. A close look at Table 4.3 shows that in both the ELS and the MLS transactions, larger firms charge higher rates (usually the modal rate) than smaller firms. Rate dispersion is smallest for larger firms indicating that they enjoy a higher degree of market power[11] (zero in the MLS case for large firms; more evidence on this issue in section 4.3.2 below). To further test the hypothesised relationship between commission rates and firm size, a joint frequency distribution of commission rates (five categories) by firm size (three categories) is provided in Tables 4.5 and 4.6 for the MLS and ELS transactions respectively. In both tables, a positive relationship is observed (Pearson's R statistics being 0.25 for the MLS and 0.22 for the ELS transactions). The standard chi-squared test rejects the independence of commission rates and firm size for both

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[11] One may argue that the higher commission rate charged by larger firms may simply reflect better quality service (eg. quicker sale, more intensive search, or years of experience of salesmen employed by larger firms) rather than market power. While this argument may be partially true, it is not very convincing for the following reasons. First, smaller firms can also provide a better quality service and charge a higher price. Second, it is observed (from the MLS sales summaries) that larger firms usually charge the uniform 7% commission rate on all properties (for details, see section 4.3.2 below) independent of house prices or intensity of search. In addition, rate variation should occur because some properties are quicker to sell, and some owners may want less quality of service. For these reasons, the above argument is difficult to accept.

TABLE 4.5: Bivariate Distribution of Commission Rates for MLS Transactions

Commission Rates	Small Firms	Medium Firms	Large Firms	Row Total
Less than 5%	1 (1.0)	0 (0.0)	1 (6.7)	2 (1.3)
5 - 6%	15 (15.3)	2 (4.9)	0 (0.0)	17 (11.0)
6 - 7%	40 (40.8)	12 (29.3)	1 (6.7)	53 (34.4)
Exactly 7%	41 (41.8)	26 (63.4)	13 (86.7)	80 (51.9)
Above 7%	1 (1.0)	1 (2.4)	0 (0.0)	2 (1.3)
Column Total	98	41	15	154
% of Total	63.6	26.6	9.7	100

Note: Figures in parentheses are the relevant column percentages.

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

TABLE 4.6: Bivariate Distribution of Commission Rates for ELS Transactions

Commission Rates	Small Firms	Medium Firms	Large Firms	Row Total
2 - 4%	10 (10.0)	2 (5.1)	1 (6.7)	13 (8.4)
4 - 5%	19 (19.0)	1 (2.6)	0 (0.0)	20 (13.0)
5 - 6%	33 (33.0)	10 (25.6)	2 (13.3)	45 (29.2)
Exactly 6%	25 (25.0)	23 (59.0)	11 (73.3)	59 (38.3)
Above 6%	13 (13.0)	3 (7.7)	1 (6.7)	17 (11.0)
Column Total	100	39	15	154
% of Total	64.9	25.3	9.7	100

Note: Figures in parentheses are the relevant column percentages.

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

types of transactions (with 8 degrees of freedom in each case, the chi-square value of 20.6 for MLS and 25.6 for ELS transactions allow the rejection of the null hypothesis at 10% and 5% level respectively for MLS and ELS cases). These results again lend support to the predicted relationship between commission rates and firm size.

Further tests were performed to examine the price discounting behaviour of member and non-member firms. The relevant contingency table is Table 4.7 (Panel A for all transactions, Panel B for MLS transactions, and Panel C for ELS transactions). The null hypothesis of no difference in the discounting behaviour of member and non-member firms could not be rejected even at 10% level of significance (the chi-square values are calculated to be respectively 2.96, 2.05 and 1.25 for *all* transactions, MLS transactions, and ELS transactions). Thus it is observed that non-members do *not* discount MLS and ELS transactions significantly more often than members. This finding can be explained by the fact that only members can establish the commission rates on MLS transactions[12] and that both members and non-members can rely upon secrecy to avoid disclosure of ELS commission rates and discounts.

Other evidence on market power arises from the implicit price discriminatory behaviour of brokers. Of all firms surveyed in 1979, approximately 90% of them charged the

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[12] Commission rates are negotiated when a listing contract is signed with a home buyer. Non-members are not allowed to sign listing contracts for MLS listings and, therefore, cannot *ex ante* determine the MLS commission rates.

TABLE 4.7: Price Discounting by Members and Non-Members, 1979.

Panel A. Price Discounting: All Transactions (MLS and ELS Combined).

	Members	Non-Members	Total
No. of Firms Discounting	45	5	50
No. of Firms Not Discounting	253	11	264
Total	298	16	314

Panel B. Price Discounting: MLS Transactions

	Members	Non-Members	Total
No. of Firms Discounting	14	2	16
No. of Firms Not Discounting	135	6	141
Total	149	8	157

Panel C. Price Discounting: ELS Transactions

	Members	Non-Members	Total
No. of Firms Discounting	31	3	34
No. of Firms Not Discounting	118	5	123
Total	149	8	157

Source: Adapted from Tables 4.1 and 4.2.

modal rate (6% for ELS and 7% for the MLS transactions) up to the value of $100,000 and a rate of 3% on sale price above that value (two block pricing scheme). To the extent that the cost of selling a home is not directly proportional to house prices, a uniform commission alone or along with a marginal commission rate applied to a single break point imply a degree of price discrimination (note that the two-block scheme may reduce the severity of discrimination) for both the sub $100,000 and above $100,000 properties.[13] As already explained in Chapter 3, selling cost is not likely to increase in direct proportion to house prices because of the existence of fixed transaction costs independent of house prices (eg. costs associated with the signing of listing contracts, property appraisal, closing a match, initial (not repeat) advertising in the MLS or other media etc.).[14]

The declining two-block pricing (7/3%) scheme, compared to a uniform 7% scheme, also indicates the presence of market power in that the same marginal commission rate (3%) is charged by almost all brokers and has persisted over a long period of time in the Edmonton and other Canadian and U.S. markets. In addition, (as discussed in Chapter 3, Proposition X), this declining two-block scheme is presumed to facilitate commission rate stability in the sale of more expensive properties where the incentives to offer secret discounts are higher relative to less expensive properties.

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[13] For example, the owners of more expensive houses (say $200,000) may still be discriminated against compared to the owners of less expensive houses (say $150,000).

[14] Note that the variable components of transaction cost (dependent on property value) may include repeat advertising, personal selling efforts, showing costs etc.

Note that under non-collusive conditions, a non-discriminatory commission structure might have consisted of a single flat fee (to reflect the fixed component of transaction costs) plus a percentage incentive bonus (to reflect the variable components of transaction costs), or at least many more such break points (to reduce the severity of possible price discrimination) for which different marginal rates would apply. Moreover, the $100,000 break point, if cost-related, would have changed with cyclical or long term trends in housing prices (eg., by adjusting to inflation) or changes in the fixed components of transaction costs. Its temporal rigidity is consistent with a collusive model in which brokers would try to avoid frequent adjustments for the sake of cartel stability (since frequent adjustments may impose significant negotiation costs and therefore undermine cartel stability).

The magnitude and cross-sectional distribution of the commission sharing parameter, β, in the MLS market are also obtained from the questionnaire survey. The frequency distribution of this variable for 1979 is reported in Table 4.8. Here, the frequency distribution of $(1-\beta)$, the share of commission going to the listing broker (LBR) is given instead of β, the share going to the selling broker (SBR). The value of 0.5 is reported by 95.3% of the brokers with a very small deviation from it by the remaining brokers. The

TABLE 4.8: Distribution of Commission Sharing Parameter, 1979.

Share (Percent)	No. of Firms	% of Firms	% of Firms(adjusted)	Cum. % of Firms
40.0	3	1.9	2.0	2.0
45.0	1	0.6	0.7	2.7
48.0	2	1.2	1.3	4.0
50.0	143	88.8	95.3	99.3
60.0	1	0.6	0.7	100.0
Total	161	100.0	100.0	-----

*Source: Questionnaire survey of the Edmonton Brokerage Industry, 1979.

minimum observed value is found to be 0.4 and the maximum of 0.6 with the mean of the distribution at 0.5.

It is thus evident that 50-50 sharing scheme ($\beta = 0.5$) is widely accepted by the firms. In addition, personal communication with several larger brokers revealed that this sharing scheme has been in effect over a long period of time and usually does not change in response to cyclical changes in the upstream housing market. This observation is also confirmed from the reported value of β in the MLS sales summaries/catalogues. It is not clear how this value is arrived at in the first place and how and why it has remained the same over time. It might be supposed that it is either unofficially approved by the real estate board or it is arrived at by mutual (tacit) aggreement among member firms. The observation of a standard value of β and its stability over time may be primarily the result of the minimization of listing-selling agents' negotiation costs, but it is also consistent with the prediction (Proposition XV) of the collusive model (since frequent adjustment may again enhance negotiation costs and also undermine cartel stability), and as already explained, the stability of β has a substantial negative effect on price competition in the brokerage market.

4.3 BROKERAGE PRICING BEHAVIOUR IN THE PRE- AND POST-1976 PERIOD

The Canadian Combines Investigation Act was extended in 1976 to include the entire service sector (including the brokerage industry) within its jurisdiction. Various sections of the Act as they apply to the brokerage industry are discussed in greater detail in Chapter 6 below. Since the purpose of the Act is to encourage price competition in the brokerage and other industries, it is necessary to evaluate empirically the success of the law in achieving the desired results. The analysis is also expected to provide additional insights about the stability of brokerage collusive pricing arrangements. With this aim in mind, section 4.3.1 discusses the potential effects of the competition policy on brokerage pricing behaviour and and its its structure, and section 4.3.2 compares the actual effects with the potential effects.

4.3.1 Potential Effects of the 1976 Combines Investigation Act

This section examines the potential effects of the 1976 extension of the Act on brokerage conduct (eg. the level and structure of commissions) and its structure (eg. entry, the number and size distribution of firms, and mergers).[15]

If competition policy is applied in the brokerage industry and if it is successful in discouraging various collusive practices, brokerage price would become more reflective of the costs of providing brokerage services. It is to be noted that competitive costs would be lower than those of an industry with an artificially high price and easy entry. In such an industry, substantial non-price competition for listings and sales elevates (in proportion to commission rates) capacity and promotional costs (Propositions III and IV in Chapters 3).

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[15] The discussion in this section draws extensively from a recent paper by Islam and Jenkins (1983).

If the brokerage market becomes more competitive, brokerage costs and hence the level of commissions would be reduced. Moreover, to the extent that some owners/sellers desire a quicker sale with reduced search costs and at a lower offer price, commissions will be lower, *ceteris paribus*, on some properties than others. With increased competition, commissions would also likely be lower on more expensive properties (provided selling costs do not rise proportionately with house prices, given that a part of the transaction cost is independent of house prices) than on less expensive ones.’‘ This would reduce the extent of price

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’‘It is observed from a recent study (Porter (1983, p 220)) that a similar effect has taken place in the New York stock brokerage market. Since the passage of the Securities Acts Amendment of 1975 (which abolished the fixed commissions on securities sales), commission revenue for NYSE members had declined 13 percent because of the advent of the negotiated rates. It is also observed that commission rate for institutional sales had declined 48 percent, while commission rate for sales to individuals fell 18 percent. Porter (1983, p 222) also reports the appearance and financial viability of discount brokerage firms (who offered discounts to retail customers of up to 40 percent on commissions) in the NYSE. These firms, unlike other established firms, did not employ account executives and did not offer any investment advice.

discrimination inherent in the fixed percentage fee structure (independent of house prices).

Although such a cost-based price structure may not evolve immediately, it is expected that the interim percentage commission structure would reflect greater variation (especially below the traditional compliance levels of 6 and 7 percent respectively for the ELS and MLS transactions), be lower for more expensive properties, and deviate from the traditional single break point (the marginal commission rate of 3% on property value in excess of $100,000). It is also expected that smaller and non-member firms will be the most likely to discount commission rates since they have little to lose and much to gain and are less likely to be detected and deterred from cheating by other firms (larger and member firms). In addition, it is predicted that any interim commission rate discounting would be more frequent in ELS rather than MLS transactions and, for that and other reasons, member agents would tend to increase their relative use of MLS in order to promote commission rate stability.

It is also worthwhile to examine the potential effect of competition policy on brokerage market structure. To the extent that competition leads to a reduction in commission rates and average costs fall less than proportionately, the number of brokers would decline as the least efficient firms, unable to make normal profits, leave the industry. If some economies exist in processing information on a larger scale, smaller firms are more likely to be inefficient and hence leave the industry. In addition, some (especially larger) firms may merge in order to exploit information economies and create a more concentrated, readily coordinated market structure (partly in response to the prohibitions on overt collusion). As a result, it is predicted that the number of firms will eventually decline and concentration increase as the (interim if not final) result of an effective competition policy.[11] However, if commission rates do not immediately fall, new firms may enter the market as discounters and attain temporary financial viability until other (older and larger) firms lower their commission rates.

4.3.2 Comparing Actual Effects with the Potential Effects

This section discusses the actual effects of competition policy and compares them with the potential effects. The key variables on which the comparison is carried out are the level and structure of commissions and the number and size distribution of firms. The analysis in this section will be brief because the level and structure of commissions were extensively discussed in section 4.2 and that of market structure (the number and size distribution of firms and mergers) in Chapter 2 (section 2.5) above.

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[11] Similar effects (eg. decrease in the number of firms through large firm mergers and the demise of some inefficient firms) were reported by Porter (1983, p 229) for the NYSE since the introduction of negotiated rates in 1975. He reports that the number of NYSE firms declined by 45, despite two relatively prosperous years. From another study, he reports that 231 firms of some size left the industry between July 1972 and November 1976. Of these 122 merged (some of them them involving well-known and highly reputed firms such as Merrill Lynch, Paine Webber, and Lehman Brothers), while 109 simply disappeared.

The first hypothesis to be tested is that the 1976 amendments led to lower commission rates or an increase in the frequency of discounting. Prior to 1976 (a period of overt collusion), member brokers adhered rigidly to the standard (6/7%) commission rate and discounting was officially non-existent.[11] In order to determine whether the observed price discounting by ERB members was significantly higher in 1979 compared to the pre-1976 period, a contingency table is constructed (Table 4.9) and the chi-square test is performed. The test is conducted separately for *all* transactions (panel A of Table 4.9), MLS transactions (Panel B) and ELS transactions (Panel C). With one degree of freedom, the calculated chi-square values of 48.7, 14.7, and 34.6 respectively permit the rejection of the null hypothesis at less than 1% level of significance. This result suggests that a significant proportion of reporting brokers discounted ELS and MLS transactions in 1979 by a full percentage point or more compared to the pre-1976 period.

An analysis of the MLS catalogues/sales summaries also provide insights into the time profile of discounting behaviour (Table 4.10) from 1976 to 1983. In 1979, 15.9% of

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[11] These rates were established as by-laws of the real estate boards with strict regulations and threat of expulsion to ensure compliance.

TABLE 4.9: Price Discounting in the Pre- and Post-1976 Period.

Panel A. Price Discounting: Pre- and Post-1976, All Transactions

	Pre-1976	1979	Total
No. of Firms Discounting	0	45	45
No. of Firms Not Discounting	298	253	551
Total	298	298	596

Panel B. Price Discounting: Pre- and Post-1976, MLS Transactions

	Pre-1976	1979	Total
No. of Firms Discounting	0	14	14
No. of Firms Not Discounting	149	135	284
Total	149	149	298

Panel C. Price Discounting: Pre- and Post-1976, ELS Transactions

	Pre-1976	1979	Total
No. of Firms Discounting	0	31	31
No. of Firms Not Discounting	149	118	267
Total	149	149	298

Source: Adapted from Tables 4.1 and 4.2.

TABLE 4.10: Time Profile of Price Discounting in the MLS Transactions, 1976-1983.

Panel A. Price Discounting by the Number of Properties Sold

	1976	1979	1981	1983
No. of Properties Discounted	30	153	104	33
No. of Properties Not Discounted	546	806	831	618
Total	576	959	935	651

Panel B. Price Discounting by the Percentage of Properties Sold

	1976	1979	1981	1983
% of Properties Discounted	5.2	15.9	11.1	5.1
% of Properties Not Discounted	94.8	84.1	88.9	94.9
Total	100	100	100	100

Source: MLS Sales Summaries, June Issues, 1976-1983.

all properties sold during the month of June were listed at a discount of one or more percentage points below the 7% rate, while a mere 3.8% were listed at a discount of more than one percentage point (Panel B of Table 4.10). The application of chi-square test again indicates that price discounting by ERB members was significantly higher in 1979 than the pre-1976 period (with one degree of freedom, the observed chi-square value of 39.6 permits the rejection of null hypothesis of no difference in the price discounting behaviour in the two periods at 1% level of significance).

Similar results also hold for the observed difference in the discounting behaviour of the top 10 as well as the remaining other (Table 4.11; Panel A and B) firms in 1979 compared to the pre-1976 period of official non-existence of discounting (the chi-square values are 57.18 and 113.8 respectively for the top 10 and the remaining other brokers. These values are significant at 1% level). It is observed from Table 4.11 (Panel B) that 9.1% of the properties were sold at a discount of one or more percentage point by the top 10 firms in 1979, while the remaining other firms were discounting at a much higher rate (i.e., 27.6% of their sales were discounted). The results are consistent with Proposition VIII.

Hence both data sources (survey data and the MLS sales summaries) appear to indicate that by 1979 the extension of the Act in 1976 had significantly increased price competition in the brokerage industry. However, examination

TABLE 4.11: Price Discounting by the Top 10 Firms and Other Firms, 1979.

Panel A. Price Discounting by the Number of Properties Sold

	Top 10 Firms	Other Firms	Total
No. of Properties Discounted	55	98	153
No. of Properties Not Discounted	549	257	806
Total	604	355	959

Panel B. Price Discounting by the Percentage of Properties Sold

	Top 10 Firms	Other Firms	Total
% of Properties Discounted	9.1	27.6	15.9
% of Properties Not Discounted	90.9	72.4	84.1
Total	100	100	100

Source: MLS Sales Summary, June Issue, 1979.

of the discounting behaviour up to 1983 would cast serious doubts on the permanence of this discounting. It is observed that by 1983 discounting frequency had become substantially lower than in 1979, i.e. fewer than 5% of all MLS transactions compared to 16% (Panel A and B of Table 4.10). In addition, the latter discounting came from only a few large firms (eg. Weber, Buxton, and Graham) who were going out of business due to a severe recession which hit the housing market during the early 1980's. The discounting by these firms were perhaps desperate attempts on their part to remain in business. It is interesting to note that a very small number of properties were sold at a discount by other large firms (eg. Lepage, Block Brothers, Remax and Royal) who have been growing in size even during the recessionary period. As a result, the discounting frequency in 1983 has virtually regressed to the 1976 level (i.e. only 5% of all properties were discounted in 1976 and 1983 (Panel B of Table 4.10)). With one degree of freedom, the observed chi-square value of 0.64 indicates that the null hypothesis of no difference in the discounting frequency in 1983 and 1976 cannot be rejected at any reasonable level of significance. Although cyclical declines in housing prices (and substantial reductions in the number of houses sold in 1983 compared to 1979 (see Table 4.10)) in the Edmonton housing market after 1980 might partially explain the reduction in discounting frequency (perhaps higher commission rates being a response to lower house prices during recessions''), the dearth of discounting in 1983 might indicate the establishment of successful (tacit) collusion in this market. It is also to be noted here that the disappearance of discounting was preceded/accompanied by an accomodating and substantial rise in market concentration (discussed in Chapter 2) mainly through mergers and bankruptcies (the latter attributable to recession).

Turning now to the effect of competition policy on market structure, the number of brokers and salesmen continued to increase up until 1980 but declined thereafter.''' It is evident from Table 4.12 that the number of brokers increased from 353 in 1976 to a peak of 413 in 1980 and then started to decline from 1981 (declined to 316 in 1983). A similar pattern is observed for the number of salesmen (see Table 4.12) and also the number of firms reporting sales in the MLS sales catalogues (see Table 2.3 in Chapter 2). However, the lateness of this turning point may simply reflect the recession in the housing market rather than the effect of competition policy *per se* and so does not provide any support to the hypothesis that increased competition has eliminated the least efficient firms. This result is not surprising given the fact that price competition has not evolved in the predicted manner. It is observed that the annual number of MLS properties sold

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''The recessionary explanation is provided by Bartlett (1981). The weakness, from a theoretical point of view, of the recessionary explanation is discussed in detail in Appendix B.

'''The decline came about mainly because some salesmen left business or some brokers exited due to recession.

TABLE 4.12: Distribution of Brokers and Salesmen in Edmonton: 1976 - 1983.

Year	No. of Brokers	No. of Salesmen	Total
1976	353	2568	2921
1977	344	2440	2784
1978	363	2799	3162
1979	398	3238	3636
1980	413	2957	3370
1981	387	2665	3052
1982	339	2122	2461
1983	316	1675	1991

*Source: Consumer and Corporate Affairs of Alberta, Real Estate Branch.

per broker[8] has shown no significant upward trend (increasing from 2.71 to 2.91 between 1976 and 1979 and then declining to 2.65 in 1982). This result indicates that excess capacity (as reflected by the the low ratio of the number of properties sold per broker) still persists and that competition within the industry has not been of sufficient vigour to reduce the high levels of excess capacity and attendant non-price rivalry.

Concentration levels in the Edmonton brokerage market increased slowly during the period prior to 1976. From Table 2.4 (Chapter 2), it is clear that CR_4 in the MLS market increased from 24 to 32 percent between 1971 and 1977 and the Herfindahl index (H) increased from 0.03 to 0.04. However, concentration has increased at a rapid rate since 1976, with CR_4 increasing to 54 percent and the H index increasing to 0.12 by 1983.

Much of this change took place in the early 1980's through a series of bankruptcies/mergers involving the disappearance of several medium to large sized firms having a combined market share of about 20 percent. For example, a few bigger companies such as Buxton (3.7% market share in 1979), Graham (3.3% market share in 1979), Kellough (5.1% market share), Weber (3.6% market share), and Friesen (3.5% market share) went out of business by 1982. By 1985, a few other firms (such as Toole and Cote, Petro city, and Cowley and Keith) were also shut down. The exit of these firms might have been precipitated by the severe recession in the Edmonton housing market after 1979. It is to be noted that the major beneficiary of these bankruptcies were the large firms such as Lepage, Block Brothers, Royal, Remax, Spencer and Canada Permanent. The latter firms were able to attract the salesmen (along with their previous listings) of the failing companies which helped them increase their market shares.

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[8] Note that there are many part-time agents/salesmen (however defined) in this industry which may partly account for a low value of output per salesman.

Turning to mergers, the latter firms not only took over company names/listings of some of the failing companies, but also a few of them were involved in outright mergers which contributed further to increased concentration in this market. The two most recent mergers, one involving Lepage[102] (the largest firm) and Royal Trust (3rd largest in 1981) and the other involving Remax and Langley (the latter two were among the top 10 firms in 1982 (see Table 2.5) are noteworthy. It is predicted (on the basis of the 1981 market shares) that CR_4 and H would rise to 66 percent and 0.15 respectively by 1985. These mergers (and perhaps the equivalent takeover of company names/listings of failing companies) might have been encouraged by the 1976 Act's prohibition of overt price fixing, i.e. the latter made it necessary for firms to merge in order to achieve a more coordinated and internally stable market structure.[103]

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[102] See Edmonton Journal, Business section, October 25, 1984.

[103] As already mentioned in a previous footnote, a similar consolidation of market structure (through mergers and the disappearance of inefficient firms) has been reported by

Considering the above evidence, it can be argued that the effect of competition policy and cyclical changes in the housing market has been to transform the brokerage industry from a loose oligopoly (low concentration) with overt collusion (during the pre-1976 period) into a tight oligopoly (moderate concentration) with tacit collusion, on an interim if not final basis. The concentration/merger wave experience of the Edmonton brokerage industry in response to prohibitions on overt collusion (at least partially) resembles the experience of the Canadian brokerage market and other Canadian industries during the merger wave of 1909-12 period.[104]

4.4 SUMMARY

The empirical results in this chapter suggest that most of the predictions of the collusive model are in general borne out. Moreover, the level and structure of commissions have not substantially changed in response to the legal promotion of competition. Commissions are still assessed as a uniform percentage of the selling price of the property (and hence are still potentially discriminatory), and they still reflect a one percentage point differential between ELS and MLS transactions. In addition, non-members and new firms also tend to follow the price structure established by

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[103](cont'd) Porter (1983, p 229) for the NYSE.

[104]See ECC report (1969, Chapter 4). Also see Reuber and Roseman (1969). A similar consolidation of market structure is also observed in the NYSE as reported by Porter (1983, p 229) as a consequence of the abolition of fixed commissions in that market.

the larger/member firms (price leaders). Commissions still include a 3% marginal rate on property value in excess of the (arbitrary) $100,000 benchmark (no other break point has emerged). They are still not cost-based (eg. a flat fee plus a percentage incentive bonus), even though recent activity by a new agent-like firm (Komputermatch Private Listing Services Inc.) shows that alternative commission structures are viable.[105] Finally, implicit price discrimination and related market power are still widely prevalent in this industry.

The effect of competition policy (to the extent that it inadvertently encouraged mergers) and the recession (which resulted in many bankruptcies) has been to substantially contribute to a more coordinated, internally stable market structure. In addition, the process of coordination has been significantly enhanced by the successful use of the institutional arrangements/practices inherent in the MLS process by board/cartel members. The analysis also suggests that the mere extension of the law to incorporate the brokerage industry has not been successful in reducing the degree of collusion in this market. The policy implications of these results are discussed in Chapters 6 and 7.

The next chapter deals with another aspect of brokerage behaviour, i.e. the role and determinants of advertising and other selling efforts in the brokerage industry. Here, emphasis is given to examining the advertising and other non-price rivalry under the alternative collusive and non-collusive models of the brokerage industry.

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[105] Komputermatch provides an MLS-type service to the seller in return for a flat fee of $300 and provides a free list of compatible sellers to prospective buyers.

5. EMPIRICAL EVIDENCE ON BROKERAGE ADVERTISING BEHAVIOUR

The role and determinants of advertising and other non-price rivalry have been extensively discussed in the literature (see Backman (1967), Borden (1942), Brozen (1974), Chamberlin (1933), Comanor and Wilson (1967), Demsetz (1959), Dorfman and Steiner (1954), Doyle (1968), Fellner (1949), Jastram (1949), Kaldor (1950), Mann (1974), Nelson (1974), Nichols (1985), Rasmussen (1952), Schmalensee (1972; 1978), Simon (1967; 1970), Stigler (1968), Telser (1964; 1966; 1968), and Williamson (1963)). At an industry level, advertising behaviour of firms has been studied by Brems (1958; automobile), Fisher *et. al.* (1949 ; automobile), Lanzillotti (1961; automobile), Loescher (1959; cement), Nicholls (1951; cigarette), Peck (1961; aluminium), Telser (1962; cigarette), Walker (1967 ; ethical drugs), Weiss (1961; liquor retailing), among others.

This chapter undertakes an empirical investigation of the role and determinants of advertising and other non-price behaviour in a real estate brokerage market. In carrying out the analysis, special attention is given to examining the advertising behaviour of brokers under the alternative noncollusive (eg. monopolistic competition) and collusive models of the brokerage industry. It is argued that advertising and related selling efforts not only constitute major inputs into the brokerage production process but also act as a substitute for price competition. The analysis ultimately points to the need for and direction of public policies in this industry (discussed in the next chapter).

This chapter is organised as follows. Section 5.1 discusses the role of advertising and other selling efforts in this industry. The relationship between advertising, price and market structure is presented in section 5.2. Section 5.3 provides some descriptive evidence on the pattern of advertising expenditures. A model of advertising behaviour and its empirical formulation is discussed in section 5.4. Sources of data and the measurement of variables are discussed in section 5.5 followed by related regression results in section 5.6. Finally, some concluding remarks are made in section 5.7.

5.1 THE ROLE OF ADVERTISING IN THE BROKERAGE INDUSTRY

The demand for real estate brokerage services essentially arises from the need for housing information while buying and selling real properties. The brokerage industry, being a service industry, is different from goods-producing industries in terms of both the nature of output and the role of related inputs. Output in the brokerage market has been defined as the number of "completed transactions" or "matches" between buyers and sellers. In order to produce a match, a broker searches for listings (sellers) and/or tries to find buyers to match those and others' listings. The search process requires expenditures on advertising and/or other selling efforts. A broker usually advertises in newspapers, television or radio; sends letters, leaflets, booklets etc. to prospective sellers and buyers; posts bill boards; and puts a 'for sale' sign on the property to be sold. In contrast to most other production activities, the brokerage production process employs advertising and other selling efforts as the two major inputs.

Unlike other inputs, advertising and other selling efforts influence demand as well as costs. Both can be used to increase aggregate demand as well as individual broker's market share at the expense of other brokers. Advertising in this industry may be persuasive as well as informative, especially if the industry is imperfectly competitive. Informative advertising improves resource allocation at least up to the point at which its marginal social benefit equals its marginal social cost (See Telser (1966); Nelson (1974)). On the other hand, persuasive advertising, to the extent that it merely reallocates market shares, may not be socially as desirable and at times be wasteful (see Kaldor (1950); Shepherd (1979)). It should be noted that many advertising messages contain components of both information and persuasion. For example, a broker may advertise that he provides a better quality service (eg. promise of a quick sale or more informational ads in newspapers) than other brokers. If the claim is true, his advertising is informative as well as persuasive.

Since most advertising messages contain components of both information and persuasion, it is difficult to identify and measure their separate effects (see Scherer (1980, p 376); Schmalensee (1972)). Some casual remarks can nonetheless be made. Newspaper and point of sale advertising (classified ads and signs), for example, are predominantly informational (see Scherer (1980, p 376)) in that they identify the broker, provide information on the type, price, location and other characteristics of the property. To the extent that such advertising is the least cost method of disseminating information, it is socially beneficial.

However, a portion of brokerage advertising in the form of agency name advertising by the dominant firms in mass media such as television and radio and in the form of brochures and letters soliciting listings (from a given stock of listings) may be purely persuasive. Such advertising is usually designed to reallocate market shares as well as to create brand loyalty and related market power (see Comanor and Wilson (1967), Mann (1974), and Scherer (1980, p 381). One may, of course, argue that creation of a brand name, although increasing market power, may be at times informative (eg. McDonalds chains). For instance, it conveys information about prices, quality of goods or services provided, *et cetera* (see Akerloff (1970) and Scherer (1980, pp 376-378)). It may also motivate producers to maintain adequate quality standards (see Scherer (1980, p 378) and Nelson (1974, p 197)). Brand name/quality differentiation in this industry may also take the form of spatial/locational advantages, more personal selling efforts by brokers and salesmen, or simply more informational ads to sell properties. A part of these differentiation, of course, reflects a better service quality (eg. more informational ads in newspapers) and is hence beneficial.

Advertising (especially mass media advertising) may also create barriers to entry (see Comanor and Wilson (1967), Mann (1974), and Williamson (1963)), increasing the likelihood that prices can be maintained continually above cost. It may also erect mobility barriers between size classes of firms (see Caves and Porter (1977)), and perhaps bias industry structure towards oligopolistic direction (see Scherer (1980, p 392)) by creating image/quality differences (perceived or real). An opposite view also prevails, i.e. advertising facilitates rather than bars entry and therefore increases competition. This view considers advertising as a powerful method by which new firms can succeed in entering the market of the already established firms. The pro-competitive nature of advertising has been emphasized by Brozen (1974), Nelson (1974), Simon (1970), and Telser (1964), among others.

The degree of advertising varies from industry to industry depending on such factors as the price of the product, frequency of its purchase, forgetfulness of consumers, consumer knowledge, *et cetera*. It is argued that the intensity of advertising should be smaller in the brokerage industry than in most other industries for the following reasons. First, housing is an expensive commodity, so buyers and sellers are more willing to shop around (since gains from search may be large), and, therefore, they are less vulnerable to persuasion[106] by brokers. Second, the housing market is characterised by transactional infrequency for specific buyers and sellers. A recent buyer or seller is unlikely to re-enter the market soon. In this case, the stock of goodwill created by advertising tends, therefore, to depreciate at a faster rate.[107] As a result, advertising in general and persuasive advertising in particular is less effective. Because of these factors, the brokerage market should experience proportionately less advertising intensity, *ceteris paribus* (eg. similar industry structure), than most other markets. However, the next section demonstrates that the proportion of advertising in this industry may nonetheless be high if brokers operate in a collusive environment.

5.2 MARKET STRUCTURE AND ADVERTISING BEHAVIOUR IN THE BROKERAGE INDUSTRY

This section focuses on examining the influence of brokerage market structure on advertising behaviour in this market. The level of commission rates and advertising (including other selling efforts) can be used by brokers as competing (substitutable) means to increase sales, market share and profits. Brokers will offer commission rate discounts and advertise to the point that marginal benefits and costs are equal for each strategy.

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[106] See Doyle (1968).

[107] Peles (1971, pp 32-58), for example, estimated that the stock of goodwill depreciated at a rate of 40-50% per annum for cigarettes (a more frequently purchased commodity) and at a rate of 100% for cars (less frequently purchased commodity). The purchase behaviour in the latter market is comparable to that in the housing market.

If the brokerage market were to behave competitively, the commission and/or commission rate would be given for an individual firm and advertising cannot be used to change the (flat) demand curve. If the market is monopolistically competitive, brokers would have incentives to differentiate their products through advertising and other selling efforts in order to gain some control over price. With relatively easy entry, the long-run equilibrium may be characterised by zero above-normal profits (at least for the marginal firms) in spite of product differentiation and that for each firm, average total cost would tend to be elevated because of promotional costs.

In comparison, the incentives to advertise would be much stronger under oligopoly, more so if the market is characterised by successful price coordination (as discussed in Chapter 3). As already explained in previous chapters, the Edmonton (and perhaps other) brokerage market is somewhat oligopolistic (CR_4 = 0.54 in 1983) and it is also characterised by successful tacit coordination to set commission rates above competitive rates.

As a result, advertising (and related selling efforts) is likely to become a preferred "rivalrous" or "competitive" strategy for the following reasons: first, commission rate discounts are viewed by other agents as a more blatant and offensive strategy than advertising; this is because price discounts directly affect its own as well as rival firm's customers; second, commission rate discounts are more easily and quickly matched by other agents while retaliatory advertising requires detailed planning and related delays (eg. months) (see Hafer (1977, p 96); Scherer (1980, p 375, p 388); Schnabel (1973)); third, it is more difficult to form as well as monitor advertising collusion than price collusion'** (see Scherer (1980); Nelson (1974)). This is especially true in the brokerage industry where price is easily observable (commission rate is printed in the MLS catalogues); fourth, commission rate discounts may not have long term effects in creating repeat/new business as advertising which create an enduring stock of goodwill (see Doyle (1968)).'°'

It is expected, therefore, that brokers will tend to prefer advertising rivalry to price rivalry/competition.''*

'**This is because advertising and other non-price rivalry can take many different forms. A collusive aggreement on all forms would be difficult achieve and perhaps more costly to monitor. It is therefore not surprising to find a considerable amount of evidence that oligopolists often fail to coordinate their advertising policies successfully. Such efforts have, in fact, failed in many cases (eg. cigarettes (see Telser (1962)); soap (see Backman (1967)); and automobiles (see Weiss (1961))).

'°'This factor may not be very strong because the goodwill created by advertising may decay very rapidly in the brokerage industry. This is because of the transactional infrequency of buyers/sellers. See also Peles (1971).

''*One may wonder why brokers do not opt for price fixing but no advertising like lawyers. One reason might be that advertising is an essential input in brokerage production process whereas it is not an essential input in the production of legal services. Second, in many situations, it

With easy entry and excess capacity, this tendency would be reinforced in the brokerage market where commission rate is fixed at an artificially high level (through implicit collusion). With high commission rate (and the consequent high profits), brokers would strive to increase the sales[111] they make with a fixed price by escalating advertising and other promotional efforts[112] (see White (1972; 1975); Weiss (1961, pp 427-30). Such non-price rivalry (including advertising) may take the form of promotional efforts to attract listings and buyers (eg. through free property appraisals, mail solicitations, advertising by large firms in mass media and free balloon rides).[113]

Thus, under these circumstances, the earlier prediction that the advertising intensity would be smaller in this industry compared to other industries (with similar market structure) may no longer hold. An oligopolistic brokerage market with tacit price coordination may display a higher advertising intensity, accommodate too many small firms who

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[110] (cont'd) is in the best interest of the client that he/she purchases legal services (eg. to protect fraud or potential legal complications), whereas the purchase of brokerage services can be easily avoided by a home owner if he so desires.

[111] The amount of the sales increase will be greater, the more elastic is the advertising elasticity of demand and less aggressively rival sellers implement offsetting advertising campaigns.

[112] White (1975) reports that intensive non-price rivalry (eg. in the form of creating and maintaining excess capacity) has occured in the airline industry in response to government regulation of price.

[113] A major proportion of this advertising (which is primarily directed to obtain a greater share of the given stock of listings/buyers) may take the form of persuasion rather than information.

would be spending appreciable sums on sales promotions and operate with considerably smaller profit margins (since high commission rate would encourage entry of new firms) in the long run.[114]

5.3 ADVERTISING EXPENDITURES: SOME DESCRIPTIVE EVIDENCE

This section provides some descriptive evidence on the nature of advertising behaviour in the Edmonton metropolitan housing market. While the sources of data and measurement of variables are discussed in greater detail in section 5.4 below, data reported in this section are derived from a questionnaire survey conducted in 1979. Out of a total of 400 firms, 150 responses were obtained which constitute 37% of the brokers. About 95% of the large and 85% of the medium firms participated in the survey. The firms are classified into three groups on the basis of the number of salesmen employed (small, medium, and large) as before (as discussed in Chapter 4 above).

It is observed that about 85% of the surveyed firms advertise in newspapers, especially in classified ads. In terms of firm size, 80.4% of the small firms, 90.2% of the medium firms and 100% of the large firms do advertise in newspapers. As already argued, newspaper ads are primarily informative (see Nelson (1974)) and are used by almost all firms. But the situation is different with respect to advertising in other mass media such as radio and television. Only 13.9% of all firms are found to advertise on television, while 20.3% advertise on radio.

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[114] For a discussion of non-pricing behaviour with similar market characteristics, see Weiss (1961, pp 427-430; liquor retailing trade) and Scherer (1980, p 386; women's dress-making)).

The incidence of TV advertising is high for the large firms (53.3%), modest for the medium firms (17.1%), and very low for the small firms (6.9%). A similar pattern is observed for radio advertising, i.e. large firms (53.3%), medium firms (29.3%), and small firms (11.6%). Note that typically TV and radio advertising are likely to have a larger component of persuasion than information and that they are usually dominated by the larger firms (see Scherer (1980); Lucas and Britt (1963); and Doyle (1968)). The domination of mass media advertising by larger firms is one reflection of oligopolistic market structure. Note that the effect of of advertising on aggregate demand is an externality to the atomistic seller and, therefore, small firms would have less incentives to advertise nationally through mass media because it would not shift much business towards them from other brokers.[118] Small firms may, therefore, prefer to adopt a less expensive medium of advertising (eg. newspapers, bill boards) rather than advertising in the TV or radio.

In terms of other methods of advertising, an opposite pattern emerges: small firms use methods such as bill boards and/or personal letters etc., more frequently than large firms. The survey also revealed that the most common form of advertising is the use of "Lot Sign" (a "For Sale" sign posted on the listed property). About 88.6% of the firms use this method (86.3%, 92.7% and 93.3% of small, medium and large firms respectively). Advertising through this media can be considered as informative; this method, like classified ads, is also extensively used by firms of all sizes. Brokers use other forms of advertising as well. About 46.8% of the firms use direct mail, 19% use bill boards, 55.1% use form and personal letters, and 45.6% use Telephone Directory Yellow Pages. These latter methods have components of both information and persuasion, and their use is similarly widespread among firms of all sizes.

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[118] See Scherer (1980).

Consider now the advertising intensity of the brokerage firms in 1979. Advertising intensity here is measured by the ratio of advertising expenditures to (gross) commissions received, ADSR. The frequency distribution of the responses from the survey is summarised in Table 5.1. Here it is observed that about 31.4% of the brokers spend less than 5% of their gross commission on advertising, 42% between 5 and 10%, 27% between 10 and 20% and finally 4% spend more than 20%. For 73 brokers, the average advertising intensity is observed to be 8.8 percent. In comparison, Schmalensee (1972, p 132) reports advertising intensity of 4.7 percent for the real estate agents, brokers and managers in the U.S. for 1965. Thus, advertising intensity appears to be quite high in this industry (in the Edmonton as well in the U.S. market).

TABLE 5.1: Frequency Distribution of Advertising Intensity, 1979.

% of commission spent on advertising	Number of Firms	% of Firms	Cumulative % of Firms
Less than 5%	47	31.4	31.4
5 - 10%	63	42.0	73.4
10 - 15%	21	14.0	87.4
15 - 20%	13	8.7	96.1
Above 20%	6	3.9	100.0
Total	150	100.0	-----

Source: Questionnaire Survey of the Edmonton Brokerage Market, 1979.

5.4 A MODEL OF ADVERTISING BEHAVIOUR

Yinger (1981) presented a theoretical analysis of the optimal search behaviour of brokers. He derived the general optimizing rule that a broker's search for buyers continues until the expected return from another unit of search is offset by the related cost. A similar marginal rule is followed in the broker's search for listings. This marginal rule is consistent with the general optimal advertising rule developed by Dorfman-Steiner (1954), Rasmussen (1952), and Stigler (1968). However, Yinger does not provide any empirical verification. His model is not amenable to empirical verification because of the complex nature of his equations and non-availability of relevant data. This section develops an operational model along the lines of Dorfman-Steiner and Rasmussen with a view to examining the determinants of advertising expenditures in the brokerage industry.

For subsequent analysis, define V as the dollar volume of completed transactions, the price of brokerage services as CR (which is expressed as a proportion), and the dollar volume of advertising expenditures as A. Assume that V depends on both CR and A, i.e.

$$V = V(CR\ ,\ A)\ ;\ \delta(V)/\delta(CR) < 0\ ;\ \delta(V)/\delta(A) > 0 \qquad (5.1)$$

Given the brokerage cost function C(V), the ith firm's profit function can be written as follows:

$$\pi = CR.V(CR\ ,\ A) - C(V(CR,A)) - A \tag{5.2}$$

where π represents profit.

The objective of the firm is to maximize π subject to the following maximum total expenditure (E) constraint:

$$C[V(CR\ ,\ A)] + A \leq E \tag{5.3}$$

The relevant Kuhn-Tucker function, L, is the following:

$$L = CR.V(CR,A) - C[V(CR,A)] - A + \lambda\{E - C[V(CR,A)] - A\} \tag{5.4}$$

where $\lambda \geq 0$.

Since $\lambda = \partial L/\partial E$, it can be interpreted as the marginal valuation of expenditure, E. The Kuhn-Tucker conditions for maximization require that the following equations hold:

$$\partial L/\partial CR = CR.\partial V/\partial CR + V - \partial C/\partial V.\partial V/\partial CR - \lambda.\partial C/\partial V.\partial V/\partial CR = 0 \tag{5.5}$$

$$\partial L/\partial A = CR.\partial V/\partial A - \partial C/\partial V.\partial V/\partial A - 1 - \lambda.\partial C/\partial V.\partial V/\partial A - \lambda = 0 \tag{5.6}$$

$$\lambda.\partial L/\partial \lambda = \lambda\{E - C[V(CR\ ,\ A)] - A\} = 0 \tag{5.7}$$

Multiplying both sides of equation (5.6) by A/(CR.V), writing $\partial C/\partial V = MC$, $(CR - MC)/CR = 1/\epsilon$[116] and $\partial V/\partial A.A/V = \alpha$, and rearranging terms, the following condition is obtained:

$$ADSR = A/(CR.V) = 1/\epsilon.\alpha.1/(1+\lambda) - MC/CR.\alpha.\lambda/(1+\lambda) \tag{5.8}$$

where ϵ and α are the price and advertising elasticities of demand, CR.V is the dollar value of gross commissions, MC is the marginal cost, and ADSR is the advertising-gross commissions ratio (proxy for advertising intensity). Note also that $1/\epsilon$ measures the Lerner index of monopoly power.[117]

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[116] The inverse relation between the Lerner index and ϵ holds when firms are maximizing profits and are in equilibrium.

Using the relationship between the Lerner index and ϵ, MC/CR can be equated to $(\epsilon-1)/\epsilon$. Substituting this into equation (5.8), the following is obtained:

$$ADSR = 1/\epsilon \;.\; \alpha \;.\; [\; 1 - \lambda\epsilon/(1+\lambda) \;] \tag{5.9}$$

This equation provides the optimal advertising intensity of a brokerage firm. If expenditure restrictions are not binding, $\lambda = 0$, and equation (5.9) reduces to the well-known Dorfman-Steiner condition. Deviation of this equation from the Dorfman-Steiner condition occurs when expenditure restrictions are binding, $\lambda > 0$. Defining the funds factor $F = [1 - \lambda\epsilon/(1+\lambda)]$, it can be shown that F and E move in the same direction[118], i.e. $\partial F/\partial E > 0$. Moreover, the variable F can be broadened in definition to reflect not only the availability of funds for advertising (for the observed mean value of ϵ, the determinants of which are discussed below), but also the reporting conventions (discussed below) for advertising expenditures. Equation (5.9) is thus rewritten as follows:

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[117] See the preceding footnote.

[118] From the equation describing F, it can be shown that $\partial F/\partial\lambda = -\epsilon.1/(1+\lambda)^2 < 0$ for absolute values of ϵ. Since $\partial\lambda/\partial E < 0$ (i.e. λ falls towards zero as maximum expenditures increase), $\partial F/\partial E = \partial F/\partial\lambda.\partial\lambda/\partial E > 0$.

$$ADSR = 1/\epsilon \,.\, \alpha \,.\, F^{a} \qquad (5.10)$$

with $\partial ADSR/\partial F > 0$ by definition and the coefficient a is positive and is allowed to deviate from unity to reflect possible non-proportionalities.

The rationale for the inclusion of F is hence two-fold. First, advertising is an investment activity. Like other investment activities, it requires financing from internal and/or external sources. When internal sources are not adequate, a firm may have to resort to external sources of financing. In this case, all firms may not have equal access to external sources of funds. For example, some firms (eg. firms affiliated with financial institutions) may have easier access to such external financing. Thus, F would assume a larger value for these firms *vis-a-vis* other firms. Second, some brokers which are ERB members or affiliated with a national brokerage firm, financial institution or Century 21 group may substitute other inputs for reported advertising or underreport total advertising outlays (some of which are made through the affiliate or franchising organization), so, *ceteris paribus*, F would assume a smaller value for these affiliated/franchising firms *vis-a-vis* other firms.

Before empirically estimating equation (5.10), several problems need to be addressed. Data to directly construct ϵ and α are unavailable. Second, $1/\epsilon$ and α are not truly exogenous (see also Schmalensee (1972, p 153)). Third, F is not directly observable, and so must be proxied by other variables. It is therefore postulated that $1/\epsilon$, α, and F are proxied by the following equations[11]:

$$1/\epsilon = k_0 e^{(k_1 DM + k_2 DN + k_3 DS + k_4 DF + k_5 DC_{21})} MX^{k_6} OFX^{k_7} CR^{k_8} AGE^{k_9} e^{u_1} \tag{5.11}$$

$$\alpha = m_0 e^{(m_1 DM + m_2 DN + m_3 DF + m_4 DC_{21})} MX^{m_5} OFX^{m_6} AGE^{m_7 + m_8 \, LOG(AGE)} e^{u_2} \tag{5.12}$$

$$F = c_0 CR^{c_1} e^{(c_2 DS + c_3 DF + c_4 DM + c_5 DN + c_6 DC_{21})} OFX^{c_7} e^{u_3} \tag{5.13}$$

where:

DM = Dummy variable (=1) if member of the real estate board, zero otherwise;

DN = Dummy variable (=1) if national firm, zero otherwise;

DS = Dummy variable (=1) if firm's shares are listed in any stock exchange ,zero otherwise;

DF = Dummy variable (=1) if the firm is associated with financial institutions such as trust or mortgage institutions, zero otherwise;

DC21 = Dummy variable (=1) if the firm is associated with the Century 21 group of firms, zero otherwise;

MX = Market share of the firm (%);

OFX = Number of office locations as a percentage of the number of houses sold (X);

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[11] The functional form is chosen for convenience and mathematical tractability.

CR = Commission Rate (%);

AGE = Age of the firm;

An interpretation of equations (5.11) through (5.13) is now in order. Consider equation (5.11) first. A firm's market power, $1/\epsilon$, has many dimensions and it can be derived from many sources. The factors included in equation (5.11) can be rationalized as follows. The variable DM is a membership dummy variable. The effect of membership in the local real estate board and therefore participation in the MLS process is expected to enhance a member broker's market power ($k_1>0$) *vis-a-vis* non-members.[128] It has also been argued (Chapter 3 and 4) that the MLS facilitates oligopolistic coordination and hence increase individual and group market power *vis-a-vis* non-members.

DN is a national dummy variable (unity if the firm operates nationally, zero if locally). It may represent one source of market power ($k_2>0$). For example, a national firm may enjoy some degree of monopoly power over company-paid inter-city moves of potential home buyers and sellers. Other sources of market power may be derived from a firm's being listed on the stock market (stock market dummy, DS; $k_3>0$); it being affiliated with financial institutions for promotional purposes (eg. banks, loan and mortgage companies) where the DF dummy variable captures this ($k_4>0$); and its being franchised by the Century 21 group of firms and so benefitting from the "brand name" (DC21 dummy variable; $k_5>0$). Note that although firms participating in this group are independently owned and operated, their joint advertising is designed to create a "brand name" which, in turn, may enhance market power.

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[128] Note that non-members are not allowed to list properties on the MLS.

The market share variable (MX) reflects the relative size of a firm. As such, it can reflect the degree of market power ($k_6>0$) enjoyed by a firm. Note that under conditions of profit maximization, ϵ can be shown to be inversely related to MX (see Needham (1976), p 30)).[21] Locational factors may also influence $1/\epsilon$. One such factor is captured by OFX which measures the number of office locations as a percentage of the number of houses sold in Edmonton.[22] Having a larger number of office locations may add to market power ($k_7>0$) because of possible informational advantages enjoyed by these firms in reaching/attracting home buyers and sellers *vis-a-vis* other firms.

The variable CR is also expected to positively proxy market power ($k_8>0$). This follows from the fact that, in equilibrium, $1/\epsilon = [CR - MC]/CR$. Given MC, a higher value of CR would be associated with a larger value of $1/\epsilon$ (see also

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[21] In addition to MX, Needham (1976) also shows that, under oligopoly, ϵ is also related to the price elasticity of market demand and output-level reactions of the firm's rivals in response to the firm's pricing policies. These complications could not be introduced into the analysis because of data limitations.

[22] Two additional variables were also tried, i.e. the number of office locations per 1000 households and the number of office locations per dollar value of housing sales, V. But the results were very similar. Only the results associated with OFX are reported in the empirical section.

Schmalensee (1972), p 154). This result is consistent with the Dorfman-Steiner argument that with a larger price-cost margin, the marginal sale becomes more profitable. Hence, it is worthwhile to devote more resources to advertising which, in turn, can create market power. This effect is stronger in the case of the brokerage market which is characterised by some degree of (implicit) coordination in setting the commission rate (CR) above the competitive rate. As discussed in section 5.2 above, with easy entry, an artificially high commission rate (and the resulting excess capacity) would encourage intensive (often socially undesirable) non-price rivalry (Propositions III and IV in Chapter 3). Note that price coordination in this industry is made easier because the commission rate is reported in the MLS catalogues (as discussed in Chapter 3).

The variable AGE (number of years a firm is in business) is expected to have a positive impact on market power. Older firms can take advantage of brand loyalty to exercise greater market power. In equation (5.11), u_1 is the stochastic error term and is included to reflect the effect of omitted variables (and possible measurement errors). k_0 is the intercept term.

Turn now to an interpretation of equation (5.12). The effect of DM on a is expected to be positive ($m_1>0$). Members may find non-price rivalry via advertising more profitable than price rivalry. A broker with an MLS listing is guaranteed a commission (regardless who sells the listing) when the listing is sold. Since a larger share of MLS listings would generate a larger flow of commissions, the MLS process may encourage substantial advertising (and other promotional efforts) rivalry in order to attract listings. The latter tendency is reinforced when the use of the MLS encourages a uniform commission (through tacit coordination) but does not regulate advertising.[133]

The effect of DN on a is also positive ($m_2>0$). National firms might find it more profitable to adopt non-price than price rivalry since these firms can reach more audience per dollar of advertising expenditures compared to their local counterparts. The effect of DF on a is also expected to be positive ($m_3>0$). Firms affiliated with financial institutions may advertise more intensively because a given amount of advertising expenditures by these firms would attract more home buyers and sellers *vis-a-vis* other firms. The buyers and sellers are attracted because they may view these firms as financially secure and at the same time, be able to arrange mortgages and other financial backing relatively easily and quickly. The sign of the coefficient of DC21 dummy variable is again positive ($m_4>0$). Firms affiliated with this group may find advertising more effective (and therefore profitable) to promote sales.

The effect of MX on a is likely to be negative ($m_5<0$). A large firm, already controlling a large portion of the market might find it increasingly difficult to increase sales by additional advertising. In addition, MX and ADSR may be inversely related if a strong "threshold" effect (due to factor indivisibilities/large economies of scale) exists in firm's advertising expenditures with respect to firm size. A significant negative relationship between firm size and advertising intensity is also reported by Schmalensee (1972, p 131), Stigler (1958), and Shepherd (1970, p 371). The "threshold" effect may arise because a certain "minimum" level of advertising may be required before sales are affected. In order to achieve this level, the smaller firms who do advertise would be forced to spend a larger proportion of sales on advertising. The inverse relationship may be reinforced for the following reasons. First, advertising agencies/media themselves may experience economies of scale in the production and selling of advertising messages. This would allow them to sell advertising messages to the larger buyers (larger brokers) at a lower price. Second, to the extent that advertising agencies/media have market power, they may practise price discrimination favouring larger brokers.[124]

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[133] Note that no effort to coordinate advertising has been observed in the Edmonton brokerage market.

The variable OFX is expected to increase α and therefore ADSR ($m_6>0$). These multi-locational firms can reach more customers (for given advertising) *vis-a-vis* other firms due to their locational and informational advantages. The age of the firm (AGE) can also partially determine α and therefore ADSR. The relationship is likely to be positive but not necessarily linear. To the extent that α measures advertising's effectiveness (see also Schmalensee (1972), p 43), a firm's advertising effectiveness may initially increase with AGE due perhaps to the ease of strengthening existing brand loyalties or buyer-seller ties. In addition, older firms may have discovered more efficient and effective methods of advertising. But diminishing marginal effectiveness from advertising may set in after a certain period of time. This is because a relatively older firm would gradually be exhausting more efficient methods of advertising and then subsequently be resorting to less effective methods. As a result, it is predicted that ADSR would initially increase and then decline with AGE. This non-linearity is captured by introducing a non-linear term with respect to the AGE variable in equation (5.12). Accordingly, it is expected that m_7 be positive and m_8 be negative.

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[124] The cost savings due to this factor can be considered as pecuniary rather than technical. The distinction between these two terms is made by Schmalensee (1972, pp 228-237).

In equation (5.12), u_2 is a stochastic error term and is included to reflect the effect of omitted variables (and measurement errors). m_0 is the intercept term.

In equation (5.13), the commission rate variable (CR) represents the availability of funds from internal sources/excess profits ($c_1 > 0$). DS reflects one external source of funds for advertising. These public firms may have an easier access to external sources of financing *vis-a-vis* other firms ($c_2 > 0$). The effect of DF (firms affiliated with financial institutions) on F and hence on ADSR is uncertain. On the one hand, it can be argued that these firms would have an easier access to external financing ($c_3 > 0$) *vis-a-vis* other firms. On the other hand, these firms may substitute advertising of the financial institution for its own reported advertising (eg. joint advertising for financial/mortgage and brokerage services), or *vice versa*, so that c_3 may become less or more positive or even negative.

Additional substitution/under-reporting possibilities may also be present. For example, those firms participating in the MLS process (DM dummy equal to unity) may substitute MLS catalogue listings for reported advertising ($c_4 < 0$). A local broker attached to a national firm (DN) may also substitute its parent's advertising through mass media such as TV and radio for reported advertising ($c_5 < 0$). Brokers affiliated with the Century 21 group of firms may substitute the advertising of the group (paid for through the franchise fee) for reported advertising ($c_6 < 0$). A similar approach to joint advertising (which create a joint brand name with these firms sharing the advertising costs) is cited by Nelson (1974) to occur in the case of franchise dealers such as McDonald's fast service restaurants or farmer cooperatives such as Sunkist oranges. The variable OFX reflects the possibility that brokers substitute office locations for reported advertising ($c_7 < 0$). c_0 is the intercept term and u_3 is the stochastic error term to capture the effect of omitted variables.

Now, substituting equations (5.11), (5.12), and (5.13) into (5.10), on taking a logarithmic transformation, and rearranging terms, the following empirical form of the equation is obtained:

$$LADSR = \phi_0 + \phi_1 DM + \phi_2 DN + \phi_3 DS + \phi_4 DF + \phi_5 DC21 + \phi_6 LMX + \phi_7 LOFX + \phi_8 LCR + \phi_9 LAGE + \phi_{10} LAGE2 + u_4 \quad (5.14)$$

where LADSR = LOG(ADSR); LMX = LOG(MX); LOFX = LOG(OFX); LAGE = LOG(AGE); LAGE2 =[LOG(AGE)]^2; $u_4 = u_1 + u_2 + u_3$; and the coefficients (k_i, m_i, and c_i) of equations (5.11), (5.12), and (5.13) are related to the coefficients in equation (5.14) in the following manner:

$$\phi_0 = LOG(k_0) + LOG(m_0) + a\ .\ LOG(c_0) \quad (5.15)$$

$$\phi_1 = k_1 + m_1 + a.c_4 \quad (5.16)$$

$$\phi_2 = k_2 + m_2 + a.c_5 \quad (5.17)$$

$$\phi_3 = k_3 + a.c_2 \quad (5.18)$$

$$\phi_4 = k_4 + m_3 + a.c_3 \quad (5.19)$$

$$\phi_5 = m_4 + a.c_6 \quad (5.20)$$

$$\phi_6 = k_6 + m_5 \quad (5.21)$$

$$\phi_7 = k_7 + m_6 + a.c_7 \quad (5.22)$$

$$\phi_8 = k_8 + a.c_1 \quad (5.23)$$

$$\phi_9 = k_9 + m_7 \quad (5.24)$$

$$\phi_{10} = m_8 \quad (5.25)$$

The algebraic sign of ϕ_i (and those of k_i, m_i, and ac_i) coefficients is presented in Table 5.2. This table indicates that ϕ_3, ϕ_8, and ϕ_9 are unambiguously positive, ϕ_{10} is unambiguously negative, and the other ϕ_i coefficients are uncertain.

5.5 DATA AND VARIABLES

The hypotheses developed in this chapter are tested using data collected mainly from primary sources such as MLS catalogues, other records of the Edmonton Real Eatate Board, government licensing records, telephone directories, newspaper articles, and the questionnaire survey conducted in 1979. The measurement of the variables and the respective sources of information are discussed below.

In estimating equation (5.14), the variables ADSR, CR, AGE, DM and DP are taken from the questionnaire survey while the variables DS and DF are obtained from a variety of sources such as telephone calls, newspapers, and the telephone directory Yellow Pages. The information on DC21 and the number of office locations for each broker are taken from the MLS sales summaries published by the Edmonton Real Real Estate Board. Note that both ADSR and CR were initially collected as a discontinuous variable and then transformed into continuous form using appropriate mid-values.[125] The

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[125] For example, in assigning values for ADSR, firms who checked the categories such as "5 - 10%", "10 - 15%", or "15 - 20%" in the questionnaire, ADSR was assigned its mid-value, i.e. 7.5, 12.5 and 17.5 respectively. Problems arose with the two extreme categories. Firms in the category "less than 5%" were assigned a value of 3.5, and those in

Table 5.2: Expected Signs of the Parameters of the Model

Sign of k_i, m_i, ac_i	Sign of ϕ_i
$k_1>0$; $m_1>0$; $a.c_4>0$	ϕ_1 uncertain
$k_2>0$; $m_2>0$; $a.c_5<0$	ϕ_2 uncertain
$k_3>0$; $a.c_2>0$	ϕ_3 positive
$k_4>0$; $m_3>0$; $a.c_3$ uncertain	ϕ_4 uncertain
$k_5>0$; $m_4>0$; $a.c_6<0$	ϕ_5 uncertain
$k_6>0$; $m_5<0$;	ϕ_6 uncertain
$k_7>0$; $m_6>0$; $a.c_7<0$	ϕ_7 uncertain
$k_8>0$; $a.c_1>0$	ϕ_8 positive
$k_9>0$; $m_7>0$;	ϕ_9 positive
$m_8<0$;	ϕ_{10} negative

market share of firm i, MX_i, was calculated as the proportion of the total number of transactions which are completed by the ith firm. The numbers are obtained from the MLS sales summaries following a process of going through each individual transaction reported in the MLS sales summaries.

5.6 THE EMPIRICAL RESULTS

The model is estimated by the method of Ordinary Least Squares (OLS) using data for 73 brokerage firms for 1979. It needs to be mentioned here that the OLS estimates may suffer from simultaneous equation bias (see Schmalensee (1972)) if some of the explanatory variables in equation (5.14) are not truly exogenous. For example, in treating CR as an explanatory variable, one has to address the issue of whether CR can reasonably be considered as an exogenous variable. As already discussed, the brokerage industry is oligopolistic and that some degree of price coordination exists in this industry. Under oligopoly, inertia in decision-making means that price (commission rate) can be treated as an exogenous variable (see Fisher (1962) and Schmalensee (1972, p 154)).

The market share variable may also introduce a simultaneity problem because MX may be determined by ADSR in

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[123](cont'd) the other extreme category "over 20%" were assigned a value of 22.5 on a pragmatic basis. As an alternative, two other values were tried for the two extreme categories, i.e. 2.5 and 23.5 respectively, but the regression results remained virtually identical. A similar procedure was followed for CR.

addition to its determining ADSR. The data limitations did not permit an adequate specification of an equation explaining MX simultaneously with ADSR. It is hoped that the resulting bias in the estimated coefficients is not very serious. In his empirical study, Lambin (1976, p 133) did not find any systematic simultaneous relationship between advertising and sales, while Strickland and Weiss observed that the application of a simultaneous equation estimation method (eg. 2SLS) did not improve the results over OLS estimates. In any case, it is advisable to bear this limitation in mind while interpreting the regression results.

The regression results of equation (5.14) are reported in Table 5.3. Estimated coefficients for the full model (equation (5.14)) are given in the first column. In order to examine whether multi-collinearity poses serious estimation problems, other versions of equation (5.14) are estimated after dropping a few variables from the full model and related parameter estimates are presented in other columns. Although it is not a rigorous procedure to deal with multi-collinearity, it is nonetheless adopted here to examine the sensitivity of the coefficient estimates with respect to possible collinearity problems. On *a priori* grounds, one may argue that a few of the explanatory variables are highly collinear. Collinearity may exist between LMX and LCR (a larger firm charging a higher commission rate), between DM and LCR (members charging a

TABLE 5.3: The Determinants of Advertising Intensity, Regression Results.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
DM	0.25c	-----	0.46a	0.26c	0.23	0.25	0.26c
t-value	(1.28)	(----)	(2.48)	(1.28)	(1.12)	(1.23)	(1.30)
DP	0.06	0.07	0.08	----	0.06	0.07	-----
t-value	(0.38)	(0.42)	(0.49)	(----)	(0.40)	(0.45)	-----
DS	0.53c	0.55c	0.48c	0.54c	0.48c	0.61b	0.65b
t-value	(1.47)	(1.54)	(1.30)	(1.52)	(1.30)	(1.80)	(1.93)
DF	-0.57b	-0.56b	-0.61b	-0.56b	-0.56b	-0.62b	-0.63b
t-value	(-1.93)	(-1.90)	(-2.01)	(-1.96)	(-1.88)	(-2.13)	(-2.19)
DC21	-0.12	-0.15	-0.08	-0.13	-0.22	-0.15	-----
t-value	(-0.60)	(-0.72)	(-0.37)	(-0.64)	(-1.08)	(-0.73)	-----
LMX	-0.12b	-0.11b	-0.09b	-0.11b	-----	-0.09b	-0.09b
t-value	(-2.01)	(-1.89)	(-1.66)	(-1.98)	-----	(-1.87)	(-2.00)
LOFH	-0.09	-0.08	-0.07	-0.09	-0.03	-----	-----
t-value	(-0.80)	(-0.77)	(-0.61)	(-0.84)	(-0.32)	-----	-----
LCR	2.30b	2.91a	-----	2.32b	2.02b	2.24b	2.18b
t-value	(2.23)	(3.19)	-----	(2.28)	(1.93)	(2.19)	(2.17)
LAGE	1.16a	1.22a	1.16a	1.15a	1.01a	1.15a	1.16a
t-value	(2.94)	(3.14)	(2.86)	(2.93)	(2.56)	(2.94)	(3.00)
LAGE2	-0.22a	-0.23a	-0.22a	-0.22a	-0.19b	-0.22a	-0.21a
t-value	(-2.69)	(-2.85)	(-2.55)	(-2.68)	(-2.32)	(-2.64)	(-2.64)
Intercept	-6.30a	-7.29a	-2.16a	-6.29a	-5.89a	-6.59a	-6.59a
t-value	(-3.22)	(-4.10)	(-3.01)	(-3.21)	(-2.99)	(-3.42)	(-3.43)
R-square	0.33	0.31	0.28	0.33	0.29	0.33	0.32
F-value	3.09	3.65	2.70	3.46	2.86	3.38	4.31

Note: (1) 'a' indicates significance at 1% level, 'b' at 5% level, and 'c' at 10% level.
(2) With 62 degrees of freedom, the critical t-values are 2.39, 1.66, and 1.28 for for significance at 1%, 5%, and 10% level respectively (one-tailed test).

higher commission rate), between DP and LMX (national firms are also larger firms), and LMX and LOFX (larger firms operate a larger number of office locations). An examination of the simple correlation coefficient reveals that correlation is not very high between LMX and LCR (r = 0.27), while the degree of correlation is moderate between DM and LCR (r = 0.50), DP and LMX (r = 0.48), and LMX and LOFX (r = 0.59). Accordingly, variables DM and LCR are dropped for versions (2) and (3) respectively, DP and LMX for versions (4) and (5) respectively, and LMX and LOFX for versions (5) and (6) respectively. Version (7) represents the coefficient estimates after dropping DP, DC21, and LOFX because of their low statistical significance (t-value less than 1 in version (1)). An examination of Table 5.3 reveals that the coefficient estimates remain highly stable (in terms of the sign, magnitude and statistical significance) with respect to this dropping procedure except for the coefficient of DM. It's magnitude and statistical significance increase greatly when LCR is dropped from the regression (compare versions (2) and (3)), although the magnitude and statistical significance of the coefficient of LCR remains stable irrespective of whether DM is included or not. Given that the estimates are stable with respect to different versions, the subsequent analysis is mainly focussed on version (1), i.e. the estimates of the full model (equation (5.14)).

In general, all the regressions are statistically significant as judged by their F-values, even though the coefficient of determination (R^2) is not very high in any version. Although a low R^2 is not uncommon in cross-section regressions, while interpreting the results it must be recognised that about two-thirds of the variation in the dependent variable remains unexplained by the regressions. More specifically, the following are notable:

(1) DM, the membership dummy variable achieves marginal significance (at 10% level) and its parameter is positive. The relatively low significance of this coefficient is partly attributable to its collinearity with LCR. The observed positive coefficient of LCR indicates that brokers participating in the MLS system appear to advertise more intensively than the non-member brokers by a margin of 0.13 percentage points on average. The positive sign is observed because positive values of k_1 and m_1 dominates negative ac_8 in equation (5.16). Thus, membership and therefore participation in the MLS process encourage firms to advertise more intensively than non-member firms. This effect appears to outweigh possible reduction of ADSR if MLS listings is used as a substitute for advertising (negative ac_8.

(2) When a firm is a national firm, it tends to advertise less intensively than other firms due perhaps to the fact that these firms are able to substitute it's parent's advertising through mass media for reported advertising. This effect appears to dominate the positive effects operating through $1/\epsilon$ and α. The relative

insignificance of this coefficient is not surprising given that opposing forces are reflected through DN (which might have cancelled each other out).

(3) The dummy variable DS achieves marginal significance (at 10% level). It has a positive effect on advertising as expected. A somewhat large coefficient of this variable can be explained by the fact that DS increases ADSR through its positive influence on both $1/\epsilon$ and F. Thus, it appears from the results that these public firms advertise more intensively than the other firms.

(4) The coefficient of DF , the dummy variable indicating whether the firm is associated with any financial institution, turns out to be negative (and significant at 5% level). The significant negative sign of this variable indicates that its positive effects are significantly dominated by opposing forces (operating through F) to reduce advertising intensity. It is quite likely that these firms are able to substitute advertising of the affiliated financial institutions for its own reported advertising. It also indicates the existence of significant economies of scope in joint advertising (eg. advertising jointly for financial and brokerage services). In addition, a brokerage firm which is linked to a financial institution enjoys the benefit of more trust and perceived easier access to mortgage financing/backing by home buyers and sellers. As a result, they can attract more customers without much advertising. Firms like Royal Trust, Montreal Trust, Canada

Trust and Canada Permanent Trust appear to enjoy such advantages.

(5) The Century 21 dummy variable, DC21, has a negative sign but its coefficient is not statistically significant. The negative sign indicates that possible cost savings through joint advertising by these firms tend to reduce ADSR. These firms also appear to substitute group advertising for its own reported advertising. This effect appears to dominate the opposite effects (operating through $1/\epsilon$ and α), the latter effects enhancing ADSR. The relative insignificance of this coefficient can be explained by the fact that the opposing forces (as reflected through DC21) might have cancelled each other out.

(6) With respect to the relationship between firm size and advertising intensity, the regression results provide a strong indication that the two variables are inversely related. The negative and statistically significant (at 5% level) coefficient of LMX captures the "threshold" effect - an effect which appears to significantly dominate the positive market power effect. Thus, due to the presence of strong "threshold" effect, smaller firms (who do advertise) have to advertise more intensively in order to be effective in increasing sales. As a result, smaller firms and potential new entrants would be at a competitive disadvantage *vis-a-vis* larger firms.

(7) The sign of the coefficient of LOFH is negative, but it is not statistically significant. The insignificance

of this coefficient can be explained by the fact that opposing forces operate through this variable to influence advertising expenditures. The regression results indicate that some locational advantages exist and that the locational presence serves as substitute for its own reported advertising. These effects appear to be strong enough to dominate the market power and other positive effects (hence the negative sign).

(8) The coefficient of the commission rate variable is found to bear the expected positive sign and is also highly statistically significant (at 5% level). This evidence supports the hypothesis that the ability of a broker to keep its commission rate high (above the competitive rate) through general price coordination and individual market power leads to an increase in its advertising expenditures. In a collusive environment, brokers thus tend to substitute advertising and other non-price rivalry for price rivalry. As already explained, non-price rivalry is likely to take the form of intensive search for listings and buyers. Note that the positive effect of CR is magnified because higher commission rate also provide firms with substantial internal sources of financing advertising expenditures. In terms of quantitative magnitude, it appears that advertising intensity is highly elastic with respect to changes in the commission rate (the relevant elasticity is 2.3).

(9) The variable AGE was used to capture the advertising's effectiveness (a). As expected, the

coefficient of LAGE is positive and LAGE2 is negative and both are statistically significant at 1% level. Increasing effectiveness to advertising is indicated at least up to a certain age of the firm. The turning point occurs at the age of 14 years after which ADSR starts declining. Using the regression results, an estimate of the advertising elasticity of demand (α) was obtained. Given the non-linear formulation, the value of α varies with AGE. For example, a value of α was found to be 0.85 for a 2 year old firm compared to 0.45 for a 5 year old firm. Note that these estimates are slightly higher than those obtained by Lambin (1976, p 136) and Nelson (1974) for various commodities.

5.7 SUMMARY

The theoretical and empirical results in this chapter provide some indication that the oligopolistic market structure and the related market power/collusion to elevate commission rates lead to high and at least partially persuasive (as opposed to informative) advertising. In addition, the MLS process seems to have encouraged brokers to substitute intensive non-price (including advertising) rivalry for price rivalry, especially in order to attract listings. The existence of the "threshold" effect in advertising and the "economies of scope" in joint advertising are also supported by the results. Substantial reduction in advertising intensity is also observed for the national firms, firms which participate with the Century 21 group of firms and firms which maintain a larger number of office locations. The presence of these economies along with the domination of the mass media by the dominant firms have the potential of segregating the market into large/branded/advertised/national group and the small/unbranded/unadvertised/regional group. The results also indicate the existence of usual diminishing returns to advertising after a certain AGE is reached.

A few shortcomings of this chapter should now be mentioned. Although the results indicate the existence of the "threshold" effect in advertising, they do not completely identify the sources of such effects. The latter information would be helpful in identifying the degree of persuasion in advertising and also whether such economies are pecuniary or technical. Second, the study could not identify and isolate the influence of various factors on broker's advertising expenditures to attract buyers *vis-a-vis* home owners. This is because such disaggregated data are not available. Third, some important explanatory variables may have been omitted from the regressions, resulting in low R^2 values. Possible candidates are conjectural pricing and advertising responses by the rival firms to each other's pricing and advertising strategies. In an oligopolistic situation, these factors might play a significant role. Many such important variables could not be included because of data limitations. Fourth, the regression estimates are subject to some degree of simultaneous equation bias to the extent that MX, CR, and ADSR are jointly determined.

The empirical results in this chapter point to the need for stronger enforcement of public policies to encourage price competition in order to directly achieve allocative efficiency but also to reduce advertising intensity in this market. The next chapter discusses and evaluates the Canadian competition policy as it applies to this industry, while Chapter 7 provides some policy recommendations.

6. CANADIAN COMPETITION POLICY AS IT APPLIES TO THE BROKERAGE INDUSTRY

As background to the policy recommendations of the next chapter, this chapter is devoted to a critical discussion of Canadian competition policy[124] as it applies to the real estate brokerage industry, particularly in the form of the 1976 version of the Combines Investigation Act. It is organised as follows: section 6.1 presents the arguments put forward by industry spokesmen against competition policy, while section 6.2 argues the need for a stronger policy in this industry. Section 6.3 identifies and examines various sections of the Act as they apply to this industry. Some court cases involving the brokerage industry are discussed in section 6.4.

6.1 THE CASE AGAINST COMPETITION POLICY

The opponents of competition policy in the brokerage industry argue that the brokerage market structure is already highly competitive and therefore, additional regulation of the industry is undesirable as well as unnecessary. The opposition mainly comes from brokerage firms and their spokesmen at different levels of organisation. At the federal level, their voice is represented by the Canadian Real Estate Association (CREA); at the provincial level by their respective provincial associations; and, finally, at the local level by the local real estate boards. The CREA, for example, has raised its concerns with respect to the Act in several of its written submissions to the Government of Canada (CREA Reports: 1970, 1974 and 1975a). The CREA [127] maintains that:

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[124] The history of Canadian competition policy dates back to 1889, one year prior to the first U.S. policy in 1890. Canadian competition policy has been, in general, milder in terms of approach, coverage and degree of enforcement than its U.S. or European counterparts. For a detailed discussion of the effectiveness of Canadian competition policy in general vis-a-vis other industrial countries, see Green (1980, ch. 7), Scherer (1970, chs. 20 and 21) and ECC Report (1969, chs. 3, 4 and 6).

> ...If the industry has a weakness, it is perhaps the over-abundant competition that exists between competing firms. It has been argued in some quarters, in fact, that the realty field is presently overcrowded by practitioners.[128]

In general, the opposition to competition policy is usually based on the following arguments: (i) that the large number of firms usually found in any local brokerage market has resulted in over-abundant competition; (ii) even if some degree of market power does exist, it cannot be maintained in the long run because of the relatively easy entry into and exit out of the industry; (iii) the costs of collusion are likely to be high and, therefore, collusive arrangements are unlikely to arise or be maintained because of the large number of firms and easy entry; (iv) the industry is already regulated (regulation of entry/ethical standards) in all provinces by respective provincial legislation. Therefore, the CREA argues, any further regulation by the federal government would not only lead to federal-provincial conflicts but also impose an unnecessary burden on the industry in its efficient operation; and (v) at the local level, the industry is also self-regulated through individual local boards with the purpose of maintaining ethical standards and fair business practices, educational standards for the practitioners, standardization of services etc. Since these regulations are fairly comprehensive and are designed to protect the public interest, additional federal regulations become unnecessary and wasteful.

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[127] The CREA , founded in 1943, is a federally chartered non-profit corporation without share capital. The corporation is governed by a Board of Directors, and by a body representing the 88 local real estate boards, ten provincial real estate associations , three internal divisions and individual members. The membership of the Association is comprised primarily of real estate agents and salesmen, plus those involved in the development, construction, management and appraisal of real property. The total membership in the CREA numbers 34,000 persons, the majority of whom also belong to one of the 85 local real estate boards or associations in Canada.

[128] CREA Report (1970), p 11.

6.2 THE CASE FOR COMPETITION POLICY

In addition to criticising the above arguments, this section provides additional arguments in favour of a strong competition policy as follows:

(i) As discussed in Chapter 3, a large number of firms and easy entry may not necessarily signify competitive behaviour. The empirical evidence (on such issues as concentration, commission rate uniformity and stability, intensive non-price rivalry) in previous chapters indicates that monopoly power exists and is growing in this industry, even with a large number of firms and easy entry.

(ii) Second, the findings also suggest that the larger firms have been successful in maintaining monopoly power in spite of entry occuring at the lower tail of the size distribution. Further, the fact that the various local and provincial associations seem to want more stringent restrictions on entry through higher educational standards (for an agent to obtain a license), still higher educational requirements for membership in local boards, various disciplinary procedures against members violating board regulations etc., has certainly not been conducive to competition in this industry.

(iii) As discussed in Chapters 3 and 4, the widespread and growing use of the MLS process has been effectively utilised by brokers as a cartel coordinating device.

(iv) The argument by the CREA that federal legislation would be superfluous and even conflicting deserves discussion in some detail. Section 92(16) of the British North America Act gives authority to provincial governments to legislate in areas of real estate.[12] As a consequence, the real estate brokerage industry is presently regulated by provincial legislation in all provinces of Canada. Real estate brokers and salesmen are licensed provincially and some of their activities (eg. code of conduct) are regulated by provincial governments.[13] The CREA strongly argues against federal legislation in this industry.[131]

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[12] This feature is retained under the new constitution of Canada.

[13] Note that provincial regulation has resulted in non-uniform standards (eg. education/entrance requirements)

A careful analysis would show that the CREA arguments cannot be accepted. First, the mere fact that the industry has been "regulated by provincial governments" in the past does not imply that it has to be so in the future as well. With the changing needs of society, new legislation is enacted, old needs change and the federal-provincial division of powers and responsibilities may be revised if circumstances demand. Second, it is difficult to understand the CREA argument that federal legislation would be "unnecessary , contradictory and wasteful". Federal legislation would not be so if it is enacted in such a way and in such areas where provincial legislation is inadequate or lacking.[132] In areas where contradictions may arise, it may indicate the need for closer federal-provincial cooperation to protect the public interest and enhance economic efficiency. [133] In addition, such cooperation may lead to the adoption of a uniform educational/entrance requirements for licensing across Canada.[134]

(v) The CREA also justifies the superiority of

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[130](cont'd) across different provinces.

[131] See the CREA Report (1974) pp 20-21.

[132] Note that federal legislation has the advantage over provincial legislation in that the latter may result in non-uniform rules regulating brokerage activities (eg. price fixing, price discrimination and restrictive MLS practices) across Canada. For example, if provincial legislation differs with respect to price fixing, this activity might be legal in some provinces and illegal in others. Note that non-uniformity across different provinces has arisen in the case of licensing requirements (see CREA Report (1975b).

[133] ECC Report (1976), pp 147-148.

[134] These requirements currently vary widely across Canada (see CREA Report (1975b)).

"self-regulation" of the industry by the local real estate boards over regulation by the federal government. It claims that federal regulations would not serve any purpose in promoting the public interest. This argument is also very difficult to accept given the fact that self-regulation by local boards serves the interests of the members, who happen to be real estate brokers rather than consumers (home buyers or sellers), while federal regulation looks to the general well-being of society.

(vi) Since the brokerage industry operates on a local basis, the extent of monopoly power exercised by relatively larger firms may be quite high. Note that if the Edmonton (and other local markets) market consists of sub-markets, monopoly power would even be higher.

(vii) Unlike many other product markets, the brokerage and other service industries are characterised by the absence of foreign competition (as an ultimate check on abuse of market power). Therefore, competition policy may be needed more in the service markets than those product markets facing foreign competition, even though relatively easy entry in this industry provides some check on the abuse of market power.

(viii) Real estate boards at various levels have attempted to standardize services provided to the home buyers and sellers. It has already been argued in Chapter 3 that such practices may be conducive to price standardization and, therefore, have the potential of reducing price competition.

They also reduce the consumer's choice among various price-quality combinations.

6.3 THE 1976 COMBINES INVESTIGATION ACT AS IT APPLIES TO THE BROKERAGE INDUSTRY

Given the need for strong enforcement of competition policy, this section is devoted to the identification and examination of the various sections of the 1976 Combines Investigation Act as they apply to the Canadian brokerage industry. The ECC Report (1969) strongly recommended that the service industries be included within the jurisdiction of competition policy.[135] More specifically, the Report referred in general and specific terms to 'real estate' (p 141) and 'services provided in connection with the sale or rental of land and buildings' (p 147). Two years later, a bill known as the 'Competition Bill' was introduced in the House of Commons (June 1971). It incorporated most of the recommendations of the ECC report, but the bill did not receive second reading because of tremendous opposition from various interest groups. In any case, in 1976, Parliament amended the Act so as to incorporate some of the ECC recommendations. In the spirit of the Report, the Act included service industries under its jurisdiction. In incorporating the service sector, section 2 of the Act reads as follows: 'product' includes an 'article' and a 'service';

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[135] See Chapters 6 and 7 of the ECC Report (1969) which deals with the case for the inclusion of service industries within the scope of competition policy.

'service' means a service of any description whether industrial, trade, professional or otherwise. The brokerage industry, thus, clearly falls within the jurisdiction of the Act. Brokerage industry behaviour might contravene the Act in the following areas:

1. Fixing of commission rates and commission sharing parameters as a form of conspiracy;
2. Conscious parallelism and joint monopolisation by ERB members ;
3. Monopoly and mergers on the part of the largest firms;
4. Price discrimination; and
5. The MLS as a form of market restriction.

6.3.1 Fixing commission rates and commission sharing parameters

Historically, the commission rate (CR) and the commission sharing parameter, β, were fixed (by overt collusion) in Canada until 1976 when the Act was amended. Available evidence suggests that even today, nine years after the Act was amended, the brokerage industry still appears to adhere to the traditional fixed commission rate and commission sharing parameter, β. Section 32(1)(b) of the Act now applies directly to price fixing in this industry. Its application has been somewhat limited. In particular, its application, like that of much of Canadian competition policy, has been rendered ineffective because of the use of such words'[136] as "unduly" or "beyond reasonable doubt" in the legislation.

Although the above two factors may limit the application of the legislation to only the most blatant cases of price fixing, the effectiveness of competition policy in this case would depend greatly on the attitude of the court in interpreting such words as 'unduly', 'detriment to public interest' and 'beyond a reasonable doubt'. Most economists agree that conspiracy to fix prices does not serve any interest other than those of the producers.[137] The ECC Report also suggested strong measures in dealing with price fixing in all service industries and it recommends the treatment of all price fixing as *per se*[138] rather than *rule of reason* offences.[139]

It is not surprising that this legislation has generated serious opposition from the brokerage industry. In three separate Reports (1970, 1974, and 1975a), the CREA went so far as to argue that fixed schedules were in the public interest. The 1975 Report reads as follows:

> ...that is that fixed commission rates were intended

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[136] For a detailed discussion of the implications of these words involving many court cases in Canada, see Green (1980), pp 168-176.

[137] Green (1980, p 176), for example, argues that all collective attempts to lessen competition should be thwarted, not just those which are 'undue'.

[138] The ECC Report (1969), pp 147-48). The only exception suggested is that related to trade union activities, the B.C. fishermen's aggreement with their customers, and other activities which are clearly subject to alternate forms of social control.

[139] Price fixing is considered as a *per se* offence in the U.S.A., i.e. undueness need not be demonstrated.

> to set a reasonable standard and a 'bench mark' of a proper tariff to eliminate predatory practices on the one hand and price gouging of the public on the other.'[40]

The 1974 Report states that:

> ...it is considered in the public interest that the consumer should be able to have some common point of reference as to the relative costs of service, prior to deciding whether to employ the services of a broker, and/or to utilise the facilities of the MLS, where such facilities exist.'[41]

This argument is not tenable because the public would obviously benefit from lower fees, or at least the choice among a range of fees and service qualities, established by competition rather than the current high rate established by collusion. Second, it is difficult to understand why a competitively determined rate would not serve just as well as a 'point of reference' for the home seller as to the relative cost of the service prior to employing a broker. In pressing for a common reference point, the CREA argues that:

> ...while specific real estate statistics are as meagre in the United States of America, as they are in Canada, the trend has been unmistakenly that when the common reference point of real estate commission was removed, the actual cost of the service to the

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[40] CREA Report (1975a), p 9).
[41] CREA Report (1974), p 11.

public tended to increase, rather than decline.[142]

This argument cannot be accepted either because: first, the report itself recognises that the claim is based on insufficient data; second, it does not give any statistics or references whatsoever in support of its arguments; third, it does not justify why and under what conditions the rate tended to rise; and fourth, since the brokerage fee is expressed as a percentage of house prices, it does not recognise that the fixed schedule would indicate that the gross commission increases in the same proportion as the inflation of housing prices (although brokerage costs may not rise in the same proportion). The CREA also argues that:

> ... where there is less competitive activity on the subject of relative rates and charges for service, the competition is more intense and more satisfactory to the consumer, in the areas of the level and degree of the service itself.[143]

This argument is also based on improper analysis. First, it implicitly assumes that competition on the basis of 'service quality' is more beneficial to the public than that based on 'price' competition; it is difficult to justify on *a priori* grounds that quality competition is always more beneficial. Second, quality competition in the brokerage industry may have taken the form of wasteful competition in soliciting inframarginal listings already available for sale in the market (discussed in Chapters 3 and 5). Third, if the rate is already fixed, it does not allow the consumer to choose the optimum price-quality combination he wants to purchase.[144]

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[142] CREA Report (1974), p 11.
[143] CREA Report (1974), p 11.

It appears that CREA arguments in favour of price fixing are less than fully convincing. In any event, perhaps because of a stronger position taken by the Consumer and Corporate Affairs of Canada and the Canadian Parliament with respect to price fixing and conspiracies, the CREA, in its general meeting on April 18, 1974, adopted a resolution recommending to all its affiliated local boards the removal of any reference to fixed commissions.[145] Note that although the CREA has recommended the abandonment of fixed commission rates, commission rates have changed little (as discussed in Chapter 4) since then. As a matter of fact, price fixing appears to continue in implicit form in spite of this recommendation. There is evidence that some boards have tended to use a 'suggested rate' instead of a 'fixed rate'. This suggested rate is nothing but the previously fixed rate under a different name.[146]

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[144] For example, a home owner who wants a quicker sale may be willing to pay a higher fee than another home owner.

[145] CREA Report (1975a), p 10).

[146] If a broker were not to follow these rates, he might face expulsion from membership (in the case of fixed rates under explicit/formal collusion) or his listings might be boycotted by other members (in the case of suggested rates under implicit/informal collusion).

6.3.2 Conscious Parallelism and Joint Monopolization

It is shown in the previous subsection that section 32(1)(b) of the Act can be applied against explicit (written) agreements. But if agreements take the form of an implicit understanding among brokers to follow a parallel pricing policy, for example following a 'suggested', or 'floating' rate or any other rate which acts as a 'focal point' of oligopolistic coordination, the present Act becomes difficult to apply. Its application would depend entirely on the willingness of the courts [147] to interpret such parallel behaviour as an evidence of the existence of a conspiracy or agreement. Of course, charges against such behaviour can be laid under section 32(1)(c) or section 32(1)(d) of the Act that the defendants had conspired or agreed or arranged to lessen competition 'unduly'.

But such charges, given existing court attitudes and interpretation, in general, are likely to be much less effective than those involving explicit agreements. As a result, many implicit agreements, including any in the brokerage industry, have yet to be challenged in the courts.[148]. This poses a serious problem in the case of the brokerage industry because, in many instances, although local boards no longer fix the commission rate explicitly, brokers may have continued to practice price fixing in implicit forms (perhaps with the previously fixed rate as the focal point of coordination).

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[147] Various court cases involving such behaviour in Canada have resulted in only a few convictions. For details, see Green (1980), pp 176-179.

[148] Green (1980, 179), for example, argues that: 'Conscious parallelism as such does not violate section 32(1). But there is some danger that the concept may become a widely used shield to protect otherwise prohibited conduct of oligopolists.

6.3.3 Monopoly and Mergers

Section 33 of the Act deals with monopoly and mergers. Like that governing price fixing, this section is likely to be relatively ineffective because these offences have to be proven 'beyond reasonable doubt'; and the situation must be one in which one or more persons must control the relevant market either 'substantially or completely', where these words may be interpreted as requiring the virtual elimination of competition; and they deal with concentration at a point in time, but may not pay much attention to the trends in concentration.

The legislation dealing with mergers is of special interest in view of the fact that the level of concentration in this industry has been steadily increasing (as discussed in Chapter 2). The recent rise in concentration (especially since 1976) is attributed to mergers and bankruptcies involving several medium to large sized firms. It is argued in Chapter 4 that the 1976 Act's prohibitions on overt collusion might have encouraged (at least partially and inadvertently) merger activity as well as takeovers of company names/listings of bankrupt/insolvent companies.

6.3.4 Price Discrimination

Section 34(1)(a) of the Act deals with price discrimination. It defines price discrimination as a *per se* offence (i.e. detriment need not be shown). Price discrimination (from an economic point of view) may have been implicitly practised in the brokerage industry (and in many other professional services such as medicine or law) all over Canada and the United States for a long period of time. The legislation in the Act dealing with price discrimination in Canada is considered as an ineffective piece of legislation for the following reasons: first, it refers to 'purchase of articles' and that 'article' by definition does not include services. So, the substitution of the word 'article' for 'product' in this section excludes all service industries, including the brokerage industry, from the prohibitions on price discrimination. This goes against the strong recommendations of the ECC Report.[149] Therefore, the existing legislation needs modification to include price discrimination in the service sector in general and the brokerage industry in particular under its prohibitions.

If section 34(1)(a) of the Act were modified by replacing the word 'product' for 'article', the legislation would apply to all service industries. But the legislation, as it now stands, would still be extremely ineffective[150] for the following additional reasons. First, since the legislation is carried out through the threat of criminal sanctions, the Crown has to prove the offence 'beyond a reasonable doubt'. Second, the discrimination has to be between purchasers who are in competition with each other. In the case of the brokerage industry, homeowners selling their homes through a broker are not unambiguously in competition with one another. Since homeowners (sellers) are not usually producers of homes, they may not be viewed by the courts as being in direct competition with one another in the sale of their homes.[181] Property sales/purchases involving home builders or developers would be more prosecutable since competition is evident. Third, the product or service purchased must be of 'like quality and quantity'. In the case of brokerage services, it would be difficult to rigorously determine if services were of 'like quality and quantity'.[182] If the brokerage services do not satisfy this qualification, the existing legislation would be inapplicable.

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[149] ECC Report (1969), p 146.

[150] For a detailed discussion and criticisms of the existing legislation on price discrimination in Canada, see Nozick (1976) and Green (1980, ch. 7)

Additional difficulties may arise because of the difference between the legal and economic definitions of price discrimination. For example, the courts may not consider the uniform fixed percentage rate (independent of house prices) as legally discriminatory although it might be discriminatory from an economic point of view (as discussed in Chapter 3). Paradoxically the court's might construe the lower marginal rate of 3 percent (applied to property value in excess of $100,000) as legally discriminatory even though such a declining two-block pricing scheme might reduce the severity of price discrimination (from an economic view point as discussed in Chapter 3). On the other hand, by so doing they would discourage brokers from giving commission rate rate discounts on more expensive properties.

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[181] Note that two home owners listing their homes for sale even in the same market cannot strictly be considered as involved in direct competition with each other in the sense that any one might go out of business from the action (eg. quicker sale) of the other party.

[182] This problem would, of course, be less serious for MLS sales because brokerage services in these cases are more standardized than ELS sales. Even in MLS sales, service quality can differ as discussed in Chapter 3.

It is to be noted that price discrimination is not necessarily harmful.[153] Therefore, this practice should be dealt with on a case by case basis and as such should be considered as a *rule of reason* rather than a *per se* or criminal offence. But one serious problem with this approach is that it would demand large administrative, research and time costs. These costs would be reduced to a large extent by dealing with price discrimination under civil law where lower standards of proof are required.

6.3.5 The MLS and Related Market Restrictions

Charges can also be laid against the participants in a system of Multiple Listing Services (MLS) under various sections of the Act. They are as follows: (i) Participation as a listing agent in the MLS typically requires prior membership[154] in the local real estate board, where both institutions can be challenged on the ground that they constitute combinations in restraint of trade under section 32 of the Act. (ii) Educational requirements established by the local (and provincial) boards on top of provincial government requirements to obtain a license can be interpreted as erecting further barriers to entry of a person into a profession in restraint of trade and it can be challenged under sections 32(1) (detailed above) and 32(3) of the Act.[155] (iii) Some applications of a "code of ethics" and "standards of business practices" by the real estate boards to discipline members (eg. for competitive behaviour such as reducing commission rates) may be challenged under section 32(1) of the Act as a combination in restraint of trade.

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[153] The cases where price discrimination can be beneficial (eg. first or second degree (third degree in some cases) price discrimination or unsystematic price discrimination) should not be prohibited.

As expected, serious concern was raised by the members of the industry, especially the CREA, against the Act as it might apply to such practices of the MLS. The CREA argues these practices are designed to serve the 'public interest' and, therefore, should be exempted from the prohibitions of the Act.[156] The next chapter discusses various policies for restructuring the MLS practices/institutions in order to achieve a more competitive brokerage market.

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[154] This practice is followed by local boards in all the provinces in Canada.

[155] This can be challenged even though provincial law may allow local boards to do so.

[156] The CREA Report (1975a), p 14.

6.4 SOME COURT CASES

In 1974, a case[187] was heard in the Supreme Court of British Columbia, in which the existence of the MLS and some of its restrictive practices were challenged on the basis of the 'Societies Act' of British Columbia. In this case, the defendant, the Vancouver Real Estate Board, was acquitted of the charges on the ground that the MLS and its various practices were not found to be restrictive and that the MLS was not operated to the detriment of 'public interest'.

A few comments on this case is in order. First, the case was challenged on the ground of violating the Societies Act of the province of British Columbia, not on the basis of the 1976 Combines Investigation Act. The conviction of the defendant society might be possible if it were challenged on the basis of the latter Act because the former does not deal with price fixing, and that the latter deals with various market restrictions in stronger terms than the former. Second, given that membership in the Board was open to all licensed brokers, the judge regarded that the MLS practices (eg. higher educational standards on top of provincial requirements and various explusionary procedures) were in the 'public interest' rather than to its detriment. While a few of the practices (eg. to maintain a code of conduct) may serve public interest, others (eg. entry restrictions) can be used to restrain trade and discipline members against price cutting. For example, the threat of expulsion of a broker from membership would mean denial to him of access to MLS listings (which constitute a very large proportion of housing transactions) and thus, have the potential of imposing severe financial hardship on the broker and even threaten his existence (see also Owen (1977)). Third, the plaintiffs also failed to convince the court that the MLS was operated as a 'restraint of trade' affecting non-member brokers adversely. It was indicated in Chapter 2 that the increasingly greater use of the MLS system may have the effect of driving the non-members out of business unless they were to join[158] the defendant society.[159] In addition, it can also be shown (from the discussion in Chapter 3) that the MLS institutions/practices can be successfully utilised to enhance price coordination (hence reduce competition) to the potential detriment of the 'public interest'. The role of public policy to regulate the MLS process is discussed in the next chapter.

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[187] The relevant sections of the verdict of the justice MacFarlane of the Supreme Court of British Columbia is reported in Appendix 'H', pp 63-67 of the CREA Report (1975a).

While the MLS practises were challenged, no cases of price-fixing have been brought before the courts for prosecution in Canada. In the United States, on the other hand, the existence and operation of the MLS has not yet been challenged in the court, but there have been some successful prosecutions against some local boards practising overt collusion in fixing[140] commission rates. For example, as Bartlett (1981, p 83) reports, in the case involving the U.S. vs. National Association of Real Estate Boards *et. al.*, in 1950, the practice of price fixing was declared to be a violation of the Sherman Act.

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[158] A broker or salesmen can join the local board without much difficulty so long as they abide by the board regulations.

[159] see also G. Rosenbluth (1976), p 33.

The justice department has also obtained several orders against real estate organisations since 1970, including at least two criminal convictions. There were also several state-initiated actions and a large number of privately initiated antitrust suits during the 1970's. For example, both Rochester, N.Y., and Northern Virginia have been successful in prosecuting the defendants for price fixing.[141] As Bartlett (1981, p 83) noted, in spite of penalties for price fixing convictions (fines), the brokerage commission rates in many local markets have remained virtually the same as before. This is not surprising given that such prosecutions were not accompanied by the sort of structural changes in the MLS system to be discussed in the next chapter.

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[140] In many local markets in the U.S.A., as in Canada, overt price fixing has been practised for decades, see for example, Bartlett (1981), Olson (1958), and Owen (1977) for more details.

[141] For details, see Bartlett (1981), Olson (1958), and Owen (1977).

7. SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

7.1 MAJOR FINDINGS

The objective of this dissertation was to undertake a comprehensive theoretical and empirical analysis of the state of competition in a typical local market of the Canadian real estate brokerage industry. The standard structure-conduct-performance paradigm was used as the underlying framework with special emphasis given to the study of brokerage behaviour and the efficiency of transactions in the market where real properties are traded. The analysis of structure dealt with the level of and trends in concentration, the sources of change in concentration, mergers and the pattern of entry. Regarding brokerage conduct, the study focussed on the nature and degree of price (eg., the level and structure of commissions) and non-price (eg., advertising) rivalry. It also examined the role and effectiveness of Canadian competition policy in stimulating effective competition and attendant behaviour and performance.

The brokerage industry is a service industry providing agency services/information to current property owners and potential buyers. Chapter 2 discussed the nature and importance of the industry, developed an analytical and conceptual framework to formalise the behaviour of different participants in the transaction process, and rationalized the existence of the brokerage system in general and the MLS process in particular. It argued that the existence of the brokerage system is attributable to the fact that information in the housing market is costly and that it is often incomplete. With respect to the relative efficiency of the MLS process *vis-a-vis* the ELS process, it is argued that the former provides superior informational efficiency (eg. economies of scale in information processing), avoids inefficiency due to the market segmentation associated with the ELS process, significantly reduces the search costs of buyers and reduces the incentives of brokers to distort/bias information.

As background information, this chapter also presented results on the level of and trends in concentration and the sources of change in concentration. Although the number of firms is large and entry is relatively easy, the results suggest that the industry is dominated by a few large firms, that the level of concentration (however measured) is moderately high and has been increasing at a relatively rapid rate since the 1976 Combines Investigation Act came into effect. The rapid rise in concentration is mostly explained by a series of mergers and bankruptcies involving several intermediate and large sized firms. The extension of the law to prohibit price fixing (along with the cyclical changes in the housing market) may have inadvertently encouraged firms to merge as a means of achieving an internally stable, readily coordinated market structure. It is also observed that the larger firms gained market shares from smaller firms and they are enjoying a greater degree of market share stability compared to the earlier periods. The above structural factors provide some indication about the feasibility of collusion in this market.

In Chapter 3, a model of brokerage behaviour was developed within the framework of profit maximisation. Two alternative formulations were presented, one describing brokerage behaviour within the framework of pure/monopolistic competition and the other within the framework of collusive oligopoly. The predictions of the two formulations were then compared and evaluated in the light of observed data in later chapters. These models were used to generate predictions about the level and structure of commissions, price discrimination, stability of the commission sharing arrangements, substantial non-price rivalry, and the continuing high turnover of brokers and salesmen in an industry with persistent excess capacity (as reflected in a low transactions/salesperson ratio). It was predicted that the fixing of the commission rate above the competitive rate (through successful oligopolistic coordination) encouraged excessive entry and allowed inefficient firms to survive and maintain excess capacity.

In this industry, oligopolistic coordination is arguably successful in spite of the fact that the industry is characterised by a large number of firms, relatively low barriers to entry, and persistent excess capacity. In particular, the conditions for successful coordination are created by the institutional arrangements inherent in and various restrictive practices associated with the MLS process. The institutional arrangements facilitating coordination include shared property rights and the associated commission sharing arrangements (which reduce but do not eliminate the incentives for competition); the practice of the listing broker's determining both his own commission and that of the selling broker; and the publication of the commission rate (which helps detection of price cutting), the commission sharing parameter and the identity of the listing and the selling broker (which implicitly discloses the market shares of all firms - such publication is useful to the detection as well as deterrence of discounting) in the MLS listing and sales catalogues.

The most restrictive practices of the MLS are the denial of listing privileges and catalogue access to non-members[162] and other participants (eg. homeowners and buyers). Related restrictions attached to Board participation include membership regulations specifying various expulsionary and disciplinary procedures and additional educational requirements (on top of provincial licensing requirements). Two key related implications of the collusive model are that one would observe less frequent commission discounting of MLS transactions than ELS transactions and less frequent discounting by large firms (price leaders) than small firms.

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[162] In Edmonton, non-members are only allowed to negotiate sale of MLS listings of member firms.

These and other predictions related to brokerage pricing behaviour were subjected to empirical testing in Chapter 4. The results indicate that most of the predictions of the collusive model are in general borne out. Following the pre-1976 era of formal collusion, the brokerage market appears to have been characterized by tacit collusion. As a matter of fact, the 1976 Act appears to have done very little to promote price competition (eg. the level and structure of commissions have not substantially changed in response to the legal promotion of competition). With respect to pricing behaviour, it is observed that the MLS commission rate exceeds the ELS rate by one percentage point; that commission rate discounts are less frequent in MLS transactions than the ELS transactions, and that large firms are less likely to discount than small firms. Official discounting of MLS transactions was absent prior to the 1976 period. A significant amount of discounting of both MLS and ELS transactions was observed in 1979 (at least partly due to the short-run effect of the 1976 changes to the Combines Act). However, discounting appears to have virtually disappeared by 1983. This might be partly explained by the onset of depression in the housing market (after 1980), assuming weakly defensible counter-cyclical pricing behaviour (Bartlett (1981)). It seems more obvious, however, that brokers might have reestablished successful tacit coordination in an increasingly concentrated market and with the aid of the MLS system.

The results also indicate that the commission sharing parameter has remained unchanged over time; the listing broker sets the commission for the selling broker; possible implicit price discrimination still persists; brokers still follow a single break point in applying a marginal commission rate of 3% and this rate has remained unchanged over time; and that excess capacity still persists in view of low ratios of properties sold per salesperson. In addition, it is also observed that competition policy (together with cyclical changes in the upstream housing market), by inadvertently encouraging mergers, may have contributed further to creating a readily coordinated, internally stable, market structure. There is thus "enough" empirical evidence (to correspond to the theoretical predictions) to make it hazardous to reject the hypothesis of collusion in the brokerage industry. The policy implications of these results are discussed in the next section.

Chapter 5 discussed the role and determinants of advertising and other non-price competition in the brokerage market. The theoretical and empirical results in this chapter provide some indication that the oligopolistic market structure and the related market power to elevate commission rates lead to high advertising and non-price rivalry, especially in the persuasive solicitation of listings. The MLS process has likely encouraged brokers to substitute intensive non-price rivalry for price rivalry, especially in order to attract listings from the given stock of listings. It is concluded that although an intensive advertising campaign (including selling efforts) may improve service quality (eg. more informational ads in newspapers achieving better/quicker matches), a part of it may be no more than a response to the advertising of other agents (defensive) and even socially undesirable.

The existence of a "threshold" effect in advertising and the "economies of scope" in joint advertising for brokerage and financial services were also supported by the results. Some reduction in advertising intensity was also observed for the national firms, firms which participate with the Century 21 group, and firms which maintain a larger number of office locations. While increasing efficiency and improving service quality, the presence of these economies along with the domination of the mass media by the dominant firms may have helped to segment the brokerage market into a large/branded/advertised/national group and a small/unbranded/unadvertised/regional group. These results point to the need for stronger enforcement of public policies to encourage price competition in order to both directly achieve allocative/output efficiency and to indirectly reduce the degree of non-optimal advertising/non-price rivalry in this market.

Chapter 6 provided a critical examination of the Canadian competition policy as it applies to this market. It is argued that various sections of the 1976 Combines

Investigation Act could potentially be applied to deal with mergers, price fixing (formal or informal), price discrimination and various restrictive MLS practices. The limitations of the potential application of various sections of the Act were also discussed.

7.2 POLICY RECOMMENDATIONS

It is generally argued that public policy can play a significant role in generating effective competition and discouraging undesirable behaviour in an industry. A number of recent studies of other industries in the United States (Feinberg, 1980; Block *et. al.*, 1981; and Garbade *et. al.*, 1982) have found that the previous indictment of the firm, in some cases the previous indictments of other firms in the industry, and the magnitude of any financial penalties upon conviction have reduced mark-ups (by about 2.4, 2.5, and 4.6 percent respectively according to Block *et. al.*. They also indicate a subsequent reduction in stock value (by about 7.5 percent according to Garbade *et. al.*) of the penalized firms. In addition, Porter (1983, p 218) reports that since the abolition of fixed commissions in the NYSE from 1975, commissions on large blocks of securities had declined almost 50 percent (48 percent for institutional sales and 18 percent on sales to individuals).

This study, therefore, argues that active measures such as investigations, indictments, convictions, penalties and injunctions for tacit collusion, mergers, and price discrimination are needed in order to stimulate competition and changes in commission rates. However, they must be accompanied by measures aimed at easing other restrictive practices in order to be successful in encouraging effective competition in this market.[163] Given the nature of the brokerage cartel (eg. its effective use of the MLS institutions/practices), fundamental changes in the current operation of the MLS are needed.[164]

This is readily seen. In the United States, commission rates and hence the degree of collusion have not been reduced in spite of many successful anti-trust prosecutions of local brokerage cartels for price-fixing/conspiracy (for details, see Bartlett (1981) and Owen (1977)). The empirical analysis in Chapter 4 also suggested that, in Canada, the mere sectoral extension of the 1976 Combines Investigation Act has done very little in encouraging price competition and discouraging various undesirable aspects of conduct and performance. The failure of the Act is evident from the dearth of discounting, the persistence of price discrimination, the stability of commission sharing arrangements, and continuing high levels of excess capacity and attendent non-price competition/rivalry.

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[163] Since the initiative for active measures is unlikely to come from an individual home owner/buyer (because the potential gain accruing to him from a successful anti-trust suit may not compensate for the anticipated costs (eg. time cost and lawyer's fees)), the initiative should come from the government (eg. Consumer and Corporate Affairs or the Restrictive Trade Practices Commission).

[164] This is because the local brokerage cartels may have been greatly stabilized (both in Canada and the United States) by the successful use of MLS institutions/practices.

Indictments for tacit collusion may draw upon the following evidence: the commission rate remaining stable at the traditional compliance levels (7 and 6 percent respectively for MLS and ELS transactions) irrespective of cyclical changes in the upstream housing market; use of a uniform percentage commission structure independent of house prices/quality of brokerage services provided; the publication of these commission rates and the "split" as a means of providing focal points for oligopolistic coordination and detecting (and deterring) formal discounting; the publication of the identity of the selling broker as a means of monitoring changes in market share and related discounting behaviour; the infrequency of discounting, especially in recent years and by large firms; the possible price discrimination implicit in the uniform percentage commission rate (except for the $100,000 break point) over a wide range of property values; the continuing use of this break point to determine the marginal commission rate of 3 percent on more expensive properties; the marginal rate of 3 percent remaining at the same level over a long period of time; the continuing high levels of excess capacity/non-price rivalry; and high and increasing levels of concentration (due largely to mergers/bankruptcies). Penalties may include large fines[168]; class action settlements; injunctions on the publication of commission rates and the identity of selling (listing) broker; and other restrictions discussed below.

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[168] Note that small fines may not have any noticeable effect in discouraging anti-competitive behaviour because expected benefits from collusion would outweigh expected cost (arising from any small fines levied upon them if convicted) of such behaviour

Indictments for mergers (especially involving large firms) should recognize the high and increasing levels of industry concentration; the large aggregate market share involved in recent takeovers of the assets/listings of solvent/insolvent companies (which accounts for almost all the recent increase in industry concentration) and the tendency of large nationally-based firms to participate in these mergers and takeovers of company names/listings. Penalties might include fines, injunction on the takeover of actual listings, assets or company names, and restrictions on the establishment of new branch offices by larger brokers.

Indictments for the market restrictions inherent in the MLS might focus on the refusal to sell offence of Section 31.2 of the Act. Related recommendations for structural change in the operation of MLS might include the following. (i) The provision that all brokers (including non-members) and homeowners (without employing a broker as an intermediary[166]) be allowed to list their properties in the MLS listing catalogue[167] for an initial and a monthly fee (with home owners advised but not required to obtain an independent appraisal of their property prior to self-listing). Potential buyers likewise should be allowed to purchase the MLS listing catalogue at a reasonable fee and then deal directly with the listing broker or the self-listed home owner. (ii) The listing broker should be permitted to set his own but not the selling brokers' commission rate. If selling brokers are allowed to negotiate their own commissions, a greater variation (due to price competition) and innovation in the commission structure might be observed.[168] For example, the selling broker might be willing to accept a lower commission rate if he can obtain a buyer quickly. Similarly, a listing broker need not disclose his commission to the selling broker and thus remain undetected from possible price cutting. (iii) Injunctions on the publication of the commission rate and the "split" in the MLS catalogue. This would increase brokerage coordination costs (especially for detection and deterrence) and thus would encourage a greater discounting frequency.

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[166] Currently, a home owner cannot list his property with the MLS without hiring a member broker as his listing agent.

[167] Similar measures (eg. allowing access to non-members) were suggested by Yinger (1981) and Rosenbluth (1976).

These measures would not only increase price competition among brokers but also have the potential of reducing communication costs associated with several, at times unnecessary, linkages in the MLS transaction process[169] and at the same time preserve the superior informational efficiency of the MLS system.

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[168] One should, of course, bear in mind that the potential benefit (in terms of more price variation) from this measure may partially be offset by the increased transaction costs (due to seperate negotiation of listing and selling brokers' commission rates).

[169] The communication costs can be reduced, for example, if a buyer obtains the MLS listings at a fee and then contacts the listing broker directly. A similar service is currently

Additional measures may include the requirement that disciplinary/expulsionary procedures not be applied to members for price discounting and ethical non-price competition. Educational requirements (on top of provincial requirements) established by boards should be allowed to the extent that they improve service quality; however, they should not be allowed to restrict entry. In some cases, higher educational requirements should be suggestive but not mandatory. The 'code of ethics' and 'standards of business practices' should likewise be allowed only to the extent that they are used to maintain ethical standards and efficient performance but not to restrict entry and discipline members for normal competition. The study also recognises the need for greater federal-provincial cooperation (in cooperation with the real estate boards/associations) in establishing Canada-wide uniform educational requirements and ethical standards of business practices.

Although the previous recommendations do not suggest the dissolution of the local real estate boards and the dismantling of the MLS *per se*, they do however argue for stronger enforcement of the existing legislation to discourage price fixing, mergers and various restrictive

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'‘'(cont'd) provided by a new firm, Kumputermatch, in Edmonton for a fee of 300 dollars. It is to be noted that this firm is viable and that, with changing technology, computerised listings can be easily produced and distributed at reasonable cost.

practices; and they do suggest fundamental changes in the MLS rules of operation. In addition to increasing competition, the latter measures are expected to increase the informational advantages of the MLS system.

As already mentioned, substantial economies of scale in information processing may be associated with the use of the MLS process. In such a situation, one might consider these as a source of market failure and therefore might recommend direct public intervention in some form (eg. to replace the MLS system with some other institutional arrangement (rather than an unqualified dismantling of the MLS) or to recommend government regulation of the commission rate[170]). For example, as Rosenbluth (1076, p 77) has suggested, the provincial governments or even the municipalities can establish and operate a centralised (computerised) system such as the MLS with open access to all interested parties.[171] This would preserve the informational advantages of the MLS without necessarily incurring the costs associated with the various restrictive provisions attached to board membership. It might reduce but would not eliminate the level of formal brokerage activity since many home owners and buyers would still want to use the services of the broker in arranging a match.[172]

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[170] The problem with this approach is that such a policy has the potential of transforming a private cartel into a public cartel as has occured under the government regulation in agriculture.

[171] Instead of replacing it, one may argue in favour of organizing a public MLS as a competing institution to the current MLS. But the existence of two or more such independent MLS-type organizations would segment the market and thus reduce the informational advantages of the MLS. Market may become segmented because some home owners or buyers may not be willing or able to contact more than one MLS. Those contacting more than one MLS would be paying higher transaction costs (eg. search costs as well as costs of signing seperate contracts with different institutions).

But a serious limitation of this approach would be that a publicly owned and operated institution may display some disadvantages of bureaucratic inefficiency and unnecessary delays. In any case, this approach might be considered only if the structural remedies mentioned earlier (including stronger enforcement of several of the more important sections of the 1976 Act such as those pertaining to conspiracy, merger, monopoly, and market restrictions and with the application of a variety of penalties and injunctions) were to fail to generate effective competition in the Edmonton and other brokerage markets in Canada.

7.3 LIMITATIONS OF THE STUDY

A discussion of the limitations of the study is in order. This study was concerned mainly with the brokerage market. It did not examine other major segments of the real estate industry (eg. building and development, speculation in real estate, and financial and other related services). It thus assumes away possible interactions between the brokerage market and the other segments of the real estate industry. The omission of these other segments from discussion would be inadvisable if the interrelations and feedbacks were quite large.

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[172] These home owners and buyers presumably have a higher opportunity cost of own time.

Second, housing is an expensive commodity and its purchase is an investment decision. Therefore the potential gains from search may be quite large. Although this study recognises the importance of search and its implications, the search process of homeowners and buyers are not elaborated and explicitly incorporated in the model.

Third, in Chapter 5, a single equation regression model of advertising intensity was specified and estimated. Although the commission rate variable can be considered as exogenous, advertising intensity and the market share variables may be jointly determined. As a result, the reported regression coefficients may suffer from simultaneity bias. It is hoped that such biases are not very serious. Fourth, the explanatory power of the estimated regression equations in Chapter 5 is not very high, indicating that some important explanatory variables may have been omitted (eg. advertising reactions of rivals in response to own advertising and *vice versa* from the set of regressors (or there may be a lot of randomness in the data)). Fifth, some estimation problems were encountered due to the presence of multicollinearity.[173]

Sixth, in Chapter 5, the presence of significant economies of scale and economies of scope in advertising was observed but this study failed to fully identify the sources of these economies. It also failed to determine the extent to which these economies are pecuniary rather than technical. Seventh, the data collected by the questionnaire survey may suffer from various biases associated with under-representation of small and non-member firms and inaccuracy of reporting by the respondents. Finally, since the various conclusions were drawn from the data collected from the Edmonton brokerage market, and although it is expected that other local brokerage markets would display similar patterns, generalization of the findings requires additional research on other local markets.

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[173] Multicollinearity may result in unreliable regression esatimates.

7.4 SCOPE FOR FUTURE RESEARCH

The limitations of the study would clearly indicate the direction in which future research in this area be conducted. First, interrelationships between/among different segments of the real estate industry can be studied. Emphasis may be placed on the implications of these linkages for the structure, conduct and performance of the brokerage market. Second, similar but independent studies can be conducted to examine the structure, conduct and performance of other segments of the real estate industry. These segments include the following: the real estate building and development industry; real estate speculation; and financing and related services.

Third, in building a model of the real estate brokerage industry, future studies might consider modelling the search process of home buyers and sellers. This might provide richer insights and predictions concerning the behaviour of the different participants in this market. Fourth, other studies might develop a more rigorous model which would treat the brokerage market and the housing market in an integrated fashion. This model might yield better predictions about the behaviour of the firms in the brokerage market. It would also allow the researcher to explore the effects of brokerage behaviour on house prices and efficiency of transactions in the housing market (eg. the amount of time or units of information required to complete a transaction). Fifth, additional research would be needed to identify the sources of the economies of scale in large scale advertising and economies of scope in joint advertising.

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8. APPENDIX A

8.1 Degree of market share instability

The market shares and the ranks of the top 20 firms for selected years from 1971 to 1981 are given in Table A.1. An empty cell in this table indicates either that the firm was not in business in that year (the firm was not yet in or went out of business) or that its rank dropped below the 20th for that year.

8.2 Market share instability and price competition

From the analysis in Chapter 2, the following are observed: (i) considerable instability in the market share of the top 20 firms; (ii) considerable changes in the ranks of those firms; (iii) and considerable changes in the composition of the dominant group (with increased dominance of Lepage). Does the above evidence suggest that there is considerable price competition in the brokerage market? One may argue that the firms which are gaining market shares are those which offer price (commission rate) rebates exceeding those of other firms. Thus an inverse relationship between changes in market share and price would be observed if price competition existed. Another variable which might affect changes in market share is the advertising intensity of the firm (ADSR, the advertising sales ratio).

Table A.2 gives the changes in market share (DMSS) of the top 20 firms in 1981. The DMSS of these firms in 1981

TABLE A.1: Top 20 Firms For Each Year, Their Market Shares and Ranks, 1971-1981.

Firms	1971		1973		1975		1977		1979		1981	
	Share	Rank	Share	Rank	Share	Rank	Share	Rank	Share	Rank	Share	Rank
Academy	----	----	----	----	1.44	16	1.78	13	0.96	17	----	----
Allied	1.93	12	----	----	----	----	----	----	----	----	----	----
Ashford	----	----	----	----	----	----	----	----	1.66	12	0.96	17
Baker	----	----	1.51	17	----	----	----	----	----	----	----	----
Barnes	----	----	----	----	----	----	----	----	----	----	1.71	12
Bell	----	----	----	----	----	----	----	----	1.31	16	----	----
Bermont	----	----	----	----	1.44	16	----	----	----	----	0.96	17
Block Bros	----	----	3.72	7	4.56	5	6.97	2	4.01	4	9.84	2
Britannia	3.65	6	----	----	----	----	----	----	----	----	----	----
Burns	1.72	15	----	----	----	----	----	----	----	----	----	----
Buxton	3.86	5	6.93	2	6.60	3	4.15	6	3.75	5	1.93	9
Byrons	----	----	----	----	----	----	----	----	0.96	18	1.18	15
Can. Perm.	----	----	3.12	10	2.16	10	2.23	12	2.53	10	2.53	6
City Savings	1.72	16	4.22	5	2.77	8	----	----	----	----	----	----
Cowley	----	----	----	----	----	----	----	----	----	----	6.31	4
Dasilva	----	----	----	----	----	----	1.34	15	----	----	----	----
Fortune	----	----	1.81	14	1.80	11	----	----	----	----	----	----
Friesen	1.72	17	2.11	13	----	----	2.82	9	3.49	7	2.35	7
Gateway	1.50	18	----	----	----	----	----	----	----	----	----	----
Graham	2.15	10	3.72	8	3.24	7	3.12	8	3.31	8	----	----

TABLE A.1: (Continued)

Haida	----	----	----	----	----	----	1.04	17	----	----	1.07	16
Ingram	1.93	13	----	----	----	----	----	----	----	----	----	----
JCM	----	----	1.51	18	----	----	----	----	----	----	----	----
JMB	----	----	----	----	1.44	16	----	----	----	----	----	----
Kellough	7.08	2	3.32	9	2.76	9	5.19	4	5.14	2	----	----
Kennedy	----	----	----	----	----	----	----	----	0.87	19	----	----
Killen	3.65	7	----	----	----	----	----	----	----	----	----	----
Langley	----	----	----	----	----	----	----	----	1.13	15	1.28	14
Lepàge	8.15	1	10.75	1	11.04	1	14.69	1	18.92	1	20.21	1
Macauly	----	----	----	----	----	----	----	----	----	----	1.82	11
Mason	----	----	1.61	15	----	----	----	----	----	----	----	----
Metro	----	----	----	----	1.32	20	----	----	----	----	----	----
Montreal	1.61	16	1.69	12	1.69	12	----	----	----	----	----	----
Murray	----	----	----	----	----	----	1.19	16	----	----	----	----
Northgate	3.22	8	----	----	----	----	----	----	----	----	----	----
Nu Lane	----	----	----	----	----	----	----	----	----	----	0.86	19
Osborne	----	----	2.71	11	----	----	----	----	----	----	----	----
Potter	----	----	----	----	----	----	1.04	17	1.92	11	0.86	19
Principal	3.01	9	----	----	----	----	----	----	----	----	----	----
Propp Ag	2.15	11	----	----	----	----	----	----	----	----	----	----
Pyrmont	----	----	----	----	----	----	1.48	14	1.66	13	----	----
Rancho	----	----	----	----	----	----	----	----	1.40	14	----	----

TABLE A.1: (Continued)

Remax	----	----	----	----	----	----	----	----	----	----	2.35	7
Riviera	----	----	----	----	----	----	0.89	19	----	----	----	----
Royal	----	----	4.12	6	3.36	6	4.15	6	4.10	3	8.34	3
Saber	----	----	1.51	19	1.44	16	----	----	----	----	----	----
Sande	1.50	19	----	----	----	----	----	----	----	----	----	----
Sicoli	----	----	----	----	5.76	4	4.75	5	----	----	----	----
Spencer	----	----	----	----	1.69	13	2.37	10	2.79	9	3.32	5
Toole	----	----	----	----	1.68	14	2.37	10	0.87	20	1.93	9
United	----	----	5.63	4	----	----	----	----	----	----	----	----
Weber	4.72	3	6.83	3	7.68	2	5.49	3	3.58	6	1.50	13
Willes	1.93	14	1.31	20	----	----	----	----	----	----	----	----
Wilroy	4.08	4	2.61	12	1.68	15	0:89	19	----	----	----	----

*Source: MLS Sales Summaries, Various Issues, 1971 to 1981.

TABLE A.2: Market Share, Commission Rate and Advertising of Top 20 Firms

Top 20 in 1981	MX (1979)	Change in MX (1979-81)	CR (1979)	ADSR (1979)
1. Lepage	18.92	1.29	7.0	8.0
2. B. Bros.	4.01	5.83	7.0	5.0
3. Royal	4.10	4.24	7.0	10.0
4. Cowley	na	6.31	na	na
5. Spencer	2.79	0.53	7.0	10.0
6. Can. Perm.	2.53	0.00	7.0	8.0
7. Friesen	3.49	-1.14	7.0	8.0
8. ReMax	na	2.35	7.0	na
9. Buxton	3.75	-1.82	7.0	8.0
10. Toole	0.87	1.06	7.0	15.0
11. Macauly	na	1.82	na	na
12. Barnes	na	1.71	6.5	4.0
13. Weber	3.58	-2.08	7.0	13.0
14. Langley	1.13	0.15	7.0	20.0
15. Byrons	0.96	0.22	6.5	4.0
16. Haida	na	1.07	7.0	7.0
17. Ashford	1.66	-0.70	7.0	6.0
18. Bermont	na	0.96	7.0	7.0
19. Nu Lane	na	0.86	na	na
20. Potter	1.92	-1.06	7.0	10.0

*Sources: (1) Data on Market Shares (MX) are collected from MLS Sales Summaries.
(2) Data on CR and CAD are collected by a Questionnaire survey.
(3) MX, CR and ADSR are expressed as percentages.

were calculated by subtracting their 1979 shares from 1981 shares. DMSS appears in column 2 and the commission rate (CR) and advertising intensity (ADSR) are given in columns 3 and 4 respectively. The CR and ADSR variables refer to 1979. If one compares CR with DMSS, one would find that, while there is little variation in the commission rate itself, firms which gained significant market shares during this period, such as Lepage, Block Brothers, Royal Trust, Toole, Haida, etc., were charging the same commission rate (7.0 %) as the the other firms such as Friesen, Buxton, Weber, Potter, etc., who were losing market shares. Thus changes in market share do not appear to be related to the commission rate at all. This independence between DMSS and CR is likely to hold for earlier periods as well, which is evident from the fact that, prior to 1976, all firms were charging the uniform commission rate of 7.0 percent (determined by the local real estate board), when again the market shares of these firms were observed to change significantly (Table A.1). With respect to the relationship between changes in market shares and advertising intensity, the association among the top 20 appears to be positive, as expected, but very weak.

For a more rigorous test involving DMSS with CR and ADSR, the following regression model is estimated:

$$DMSS = a_0 + a_1 CR + a_2 ADSR + a_3 MSS_{79} + error \qquad (A.1)$$

where MSS_{78} is the market share of the firm in 1979. It is expected that a_1 is negative, a_2 is positive, and a_3 is positive if firms, which were larger in the initial period, enjoy certain advantages over other firms. Equation (A.1) is estimated using the OLS method and the regression coefficients are presented in Table A.3. The results show that in all regressions, a_1 is negative (except equation 1), as expected, but not significantly so. This suggests that the market share instability may not be explained by the presence of vigorous price competition in this industry. The coefficient of the ADSR variable has a negative sign and is also statistically insignificant, indicating that advertising is not a very effective method of gaining market share either. The coefficient of the MSS_{78} variable has the expected positive sign and is highly statistically significant (indicating that larger firms were getting larger, perhaps due to economies of scale and related increase in service quality).

8.3 Sources of change in market shares

The following analysis discusses Grossack's measure to analyse the sources of change in market shares and concentration. As already mentioned, the Herfindahl index, H, provides a useful analytical tool for the examination of structural change. Given the definition of H as:

$$H_t = \Sigma P_{it}^2 \qquad \text{(A.2)}$$

TABLE A.3: Explaining Market Share Changes: Some Regression Results

Variavles	(1)	(2)	(3)	(4)	(5)
CR	0.12	----	0.22	----	-0.10
t-value	0.21	----	0.37	----	-0.17
ADSR	----	-0.25	-0.36	----	-0.18
t-vale	----	-0.33	-0.45	----	-0.23
MX	----	----	----	0.23	0.20
t-value	----	----	----	2.98	2.72
Intercept	-0.80	0.15	-1.27	0.78	0.51
t-value	-0.21	0.30	-0.33	0.18	0.14
R-Square	0.0006	0.002	0.004	0.08	0.09
F-value	0.05	0.12	0.13	2.85	2.55

*Sources:(1) Data on Market Shares (MX) are collected from MLS Sales Summaries.
(2) Data on CR and CAD are collected by a Questionnaire survey.
(3) ADSR is taken from the questio[illegible]re survey (at midpoint values).

and its decomposition into

$$H_t = \Sigma\, p^2_{it} + (\ 1/n_t\ ) \tag{A.3}$$

where

$$p_{it} = P_{it} - P_{mt} = P_{it} - 1/n_t \tag{A.4}$$

where subscript t refers to time t and P_{mt} is the mean market share (equal to $1/n_t$).

To construct a dynamic measure, data on market share of individual firms are required for at least two years. Let P_{it} be the market share of firm i in the terminal year t and $P_{i(t-k)}$ be that of the initial year (t-k), where k can be any positive integer and p_{it} and $p_{i(t-k)}$ are the deviations of P_{it} and $P_{i(t-k)}$ from their respective mean values. The coefficient of a regression of terminal year on initial year shares is given by:

$$b_{t(t-k)} = [\Sigma p_{it}.p_{i(t-k)} \ / \ \Sigma p^2_{i(t-k)}] \tag{A.5}$$

which can be re-written as:

$$b_{t(t-k)} = [\ 1 + \Sigma w_i\ \{p_{it} - p_{i(t-k)} \ / \ p_{i(t-k)}\ \}\ ] \tag{A.6}$$

where

$$w_i = [\ p^2_{i(t-k)} \ / \ \Sigma\ p^2_{i(t-k)}\ ] \tag{A.7}$$

From equation (A.6), it appears that the regression coefficient will differ from unity by an amount and direction that is a function of the weighted average of the relative changes from year (t-k) to year t in the deviations of the firms' market shares from their means. The definition of w_i in equation (A.7) indicates that the firms which are farther above/below the mean market share in the initial year are given greater weight in determining the value of b. If n_t is large, the mean market share, given by $(1/n_t)$, would tend to zero and the b coefficient can be directly interpreted. If b is less than unity, say 0.85, then the firms which were large in the initial year lost, on the average, about 15 percent of their market shares. When b is greater than unity, say 1.1, then they have increased their share by 10 percent.[174]

This analysis can be extended further to investigate whether the loss (gain) by the larger firms has been to (from) other large firms or to (from) small firms and/or new entrants. With a simple manipulation, the b coefficient can be rewritten as:

$$b_{t(t-k)} \cong r_{t(t-k)} \cdot RH_{t(t-k)} \qquad \text{(A.8)}$$

where $r_{t(t-k)}$ is the coefficient of correlation between market shares in periods t and (t-k), $RH_{t(t-k)}$ is the square root of $RHX_{t(t-k)}$, and $RHX_{t(t-k)}$ is the ratio of the Herfindahl indices of periods t and (t-k). The correlation coefficient reflects the degree to which market shares in the two periods were stable. If firms, especially large firms are able to maintain their relative shares in the two periods, r is likely to be close to unity. Otherwise, it would be less than unity, indicating instability in the market shares.[178] The RH coefficient , on the other hand, would indicate the trend in overall industry concentration. For example, if RH is greater (less) than unity, concentration as reflected by the Herfindahl index is increasing (decreasing). The value of b then depends on the degree of correlation between market shares in the two years and the trend in overall concentration as reflected in RH. The following interesting cases were identified by Grossack: (i) Case I: for $b > 1$, it is clear that the following two conditions must hold: concentration rises and the value of r is close to unity. In this case, concentration is increasing and, at the same time, large firms as a group are gaining market share from small firms and/or exiting firms. Since r is close to unity, large firms do not seem to be losing market share to each other. (ii) Case II: For $b < 1$, r by itself is low with RH close to unity. Here, concentration is not rising and large firms may be losing market share to each other. (iii) Case III: For $b < 1$, RH is low with r close to unity. In this case, large firms do not seem to lose share to each other but tend to to lose market share as a group to small firms and/or new entrants. (iv) Case IV:

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[174] For details, see Grossack (1965), p 303.

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[178] Gort (1963) , p 52 uses r as a measure of market share stability.

For $b < 1$, both r and RH are low. Here, large firms appear to lose market share to each other as well as to small firms and/or new entrants.

Given the above framework of analysis, it is now possible to analyse sources of change in market shares in the brokerage industry. Table A.4 reports the regression coefficients of all possible combinations of terminal year and initial year market shares. The top corner entry of 1.0038, for example, is the estimated b coefficient when 1981 market share (MSS_{81}) is regressed on 1979 market share (MSS_{79}). Similar interpretations hold for the other entries in the first row of this table, where MSS_{81} is kept as the terminal year market share. The first entry in the second row, for example, represents the b coefficient when MSS_{79} is regressed on MSS_{77}. Concentrating on one particular row, if one goes farther back in time, the b coefficient becomes smaller in magnitude for the obvious reason that the correlations of market shares are smaller as the terminal year is farther from the initial year. The results corresponding to equation (A.8) are presented in Table A.5 for all possible combinations of terminal year and initial year pairs. Column 1 gives the b coefficient (from Table A.4) which is the product of $RH_{t(t-k)}$ in column 2 and $r_{t(t-k)}$ in column 3. Block A represents results for which the terminal market share is that of 1981, Block B corresponds to the terminal market share as that of 1979 , and so on up to Block E.

TABLE A.4: Regressions of Terminal Year on Initial Year Market Shares

Estimated 'b' Coefficient of Independent Variables

Dep. Variables	MX 79	MX 77	MX 75	MX 73	MX 71
MX 81	1.0038 (33.41) (0.74)	1.0397 (28.38) (0.67)	0.9572 (18.51) (0.47)	0.8935 (16.94) (0.42)	0.6842 (9.31) (0.18)
MX 79	------	1.0009 (46.81) (0.85)	0.9563 (26.02) (0.63)	0.9035 (23.65) (0.59)	0.8722 (16.19) (0.40)
MX 77	------	------	0.9870 (39.21) (0.80)	0.8522 (25.15) (0.62)	0.7916 (15.81) (0.39)
MX 75	------	------	------	0.8372 (32.40) (0.73)	0.7319 (16.38) (0.41)
MX 73	------	------	------	------	0.8110 (19.02) (0.48)

*Notes: (1) MX81, MX79, MX77, MX75, MX73, MX71 are the Market Shares of firms for 1981, 1979, 1977, 1975, 1973, 1971 respectively.

(2) Figures in the first parentheses below the regression coefficients are the t-values.

(3) Figures in the second parentheses below the regression coefficients are the R-Square values.

TABLE A.5: Sources of Change in Market Shares and Concentration.

Time Periods (Year Pairs)	(1) 'b'	(2) Sq. root of RH	(3) 'r'
A. 1981 as Terminal Year			
(1981, 1979)	1.0038	1.1592	0.8659
(1981, 1977)	1.0397	1.2533	0.8296
(1981, 1975)	0.9572	1.3748	0.6762
(1981, 1973)	0.8935	1.3509	0.6614
(1981, 1971)	0.6842	1.5592	0.4388
B. 1979 as Terminal Year			
(1979, 1977)	1.0009	1.0812	0.9257
(1979, 1975)	0.9563	1.1860	0.8063
(1979, 1973)	0.9035	1.1654	0.7753
(1979, 1971)	0.8722	1.3451	0.6484
C. 1977 as Terminal Year			
(1977, 1975)	0.9870	1.0969	0.8998
(1977, 1973)	0.8522	1.0779	0.7906
(1977, 1971)	0.7916	1.2441	0.6363
D. 1975 as Terminal Year			
(1975, 1973)	0.8372	0.9826	0.8520
(1975, 1971)	0.7318	1.1314	0.6453
E. 1973 as Terminal Year			
(1973, 1971)	0.8110	1.1542	0.7027

8.4 The Analysis and measurement of permanent concentration

The level of concentration at a point in time or its trend over a period of time may not properly reflect true monopoly power in an industry. This is because the underlying forces of change may be temporary rather than permanent. In another paper, Grossack (1972) developed a framework , following Friedman and Kuznets (1954, ch7), which can be used to measure permanent industrial concentration. In the spirit of Friedman and Kuznets, the market share of a firm is conceived to comprise two components, one permanent and the other transitory. The permanent components are those portions of the market shares that the firms are able to maintain over a period of time and the transitory components are those portions present in only one year.[174]

Firms that have large shares of a particular market in a particular period may enjoy a set of advantages such as branding, patent holdings, control of scarce resources, good trade connections, control of strategic distributive outlets, favourable financing, etc., relative to those of smaller firms and potential entrants. Some of these advantages may be permanent and others may be temporary or transitory. Grossack emphasised that these advantages are reflected in observed market shares and that the more permanent advantages are the ultimate bases of the market power of larger firms. Since permanent advantages operate over several years, one can isolate the permanent from the transitory components of advantages and market shares in any particular "base" year only with respect to some "reference" year. Of course as one changes the reference year there should be changes in the permanent and transitory components in the base year. Thus, in empirical applications, it is desirable to work with data from several years to gain more insight into these issues.

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[174] Grossack (1972), p 746.

In developing the methodology, the Herfindahl index is again used as a structural measure of concentration. Since the methodology and the underlying assumptions are available in Grossack (1972), they will not be elaborated here. Assume p_{i0} and p_{it} are the deviations of the ith firm's shares from the mean market share[177] in each of the two periods (0 referring to the "base" period and t referring to the "reference" period). These observed deviations are decomposed into two parts in each of the years, a permanent component (subscript z) and a transitory component (subscript s) and, assuming the permanent and transitory components are additive, the following equations can be written:

$$p_{i0} = p_{i0z} + p_{i0s} \tag{A.9}$$

$$p_{it} = p_{itz} + p_{its} \tag{A.10}$$

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[177] the mean market share remains same for all years, i.e. (1/n) because n remains same because of the way entries and exits are handled. For details, see Grossack (1972).

and the observed Herfindahl index for the base year is given by:

$$H_{oo} = [\ \Sigma\ p_{io}^2 + (\ 1/n\ )\ ] \qquad (A.11)$$

Now substituting the sum of squares of the permanent components of the deviations for the observed deviations, the permanent Herfindahl index can be written as follows:

$$H_{oz} = [\ \Sigma\ p_{ioz}^2 + (\ 1/n\ )\ ] \qquad (A.12)$$

With this definition of H_{oz}, the statistical problem is to derive a value for the expression of the first term on the R.H.S. of equation (A.12) from the observed market shares. In deriving an empirical form of equation (A.12), Grossack proposes two alternative models as follows:

8.4.0.1 The proportionality model

$$H_{oz} = [\Sigma p_{ioz}^2 + (1/n)] = [\ r\ .\ \Sigma p_{io}^2 + (1/n)] \qquad (A.13)$$

where r is the correlation coefficient of the two year's observed market shares. The underlying assumption in this model[178], Friedman and Kuznets, is that the ratios of permanent to the observed variances are the same for both years.

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[178] For details of derivation including the underlying assumptions, see Grossack (1972), pp 749-51.

8.4.0.2 The equality model

$$H_{0z} = [\ p^2_{i0z} + (1/n)\ ] = [\ b\,\Sigma\, p^2_{i0} + (1/n)\ ] \qquad \text{(A.14)}$$

where b is the coefficient of regression of the observed market shares in the reference year on the observed market shares in the base year. The underlying assumption of this model[17], again due to Friedman and Kuznets, is that the permanent advantages have the same absolute impact on the permanent components of every firm's market share in both years.

It is difficult to determine which model is to be preferred. Grossack maintains that while the proportionality model has easier interpretations and more realistic assumptions, the equality model has the potential of generating richer insights. He suggests that if data for more than one reference year are available, the equality model may be employed in spite of its hazards. This study uses both models in deriving estimates of the permanent Herfindahl index and also uses two alternative base years, i.e. 1975 and 1977 to examine the sensitivity of the results with respect to base changes. The results are given in Table A.6 for both models. The estimated permanent Herfindahl index,

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[17] See Grossack (1972), pp 749-52 for details.

TABLE A.6: Indices of Permanent Concentration, 1971-1981.

Year	Observed Herfindahl Index	Permanent Herfindahl Index			
		Proportionality Model		Equality Model	
		1975 Base	1977 Base	1975 Base	1977 Base
1971	0.0283	0.0244	0.0288	0.0273	0.0353
1973	0.0377	0.0314	0.0352	0.0308	0.0378
1975	0.0364	0.0364	0.0397	0.0364	0.0433
1977	0.0438	0.0330	0.0438	0.0359	0.0438
1979	0.0512	0.0298	0.0408	0.0349	0.0439
1981	0.0688	0.0254	0.0368	0.0349	0.0455

*Note: The method of constructing these indices are discussed in Appendix A.

H_{oz}, with respect to base year 1975 is graphed in figure A.1 and for base year 1977 in figure A.2. H_{oz} in figures A.1 and A.2 are expected to trace out through time the distribution of firm sizes of the base year. A point on this graph would represent the permanent Herfindahl index for year 0 (base year) for a particular reference year. The H_{oz} for year 0 with 0 as the reference year , H_{oo}, is the observed Herfindahl index.

Consider the case of the 1975 base first. While the observed Herfindahl index ,H_{oo}, is increasing rapidly from 1971 to 1981, the H_{oz} of the equality model is observed to gain stability after 1975, but the H_{oz} of the proportionality model continues to decline (slightly). A similar pattern is observed in figure A.2 for the case of the base 1977. Using the equality model, it is now possible to compare the shape of this curve with the hypothetically generated curves reported by Grossack (figure 1, panels a through f in Grossack(1972), p 759). With low values of H_{oz} relative to H_{oo}, it is possible to infer that the transitory factors played a role in increasing concentration in 1975 with respect to the reference years. The question is how strong was the influence of transitory factors? If H_{oz} rose rapidly over time prior to the base year and fall rapidly thereafter, as depicted in Grossack's figure 1, panel a, one could conclude that size advantages or disadvantages were absent and that strong

Figure A-1: Permanent Concentration: 1975 Base

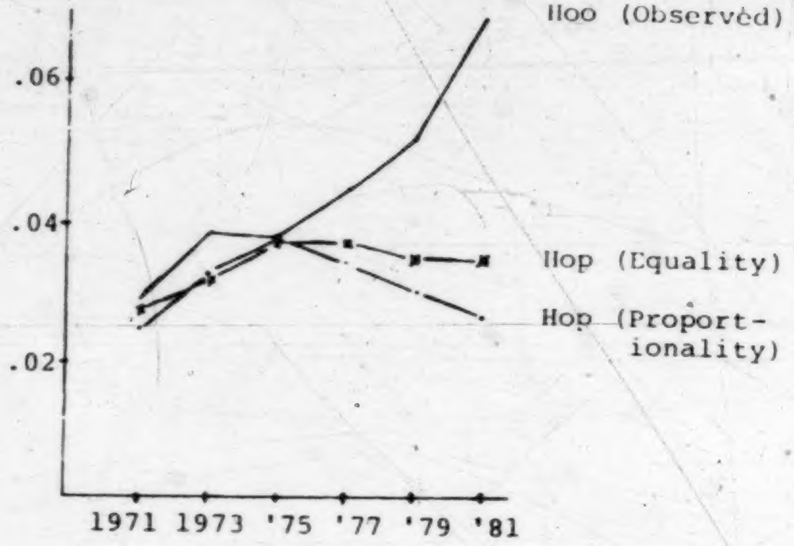
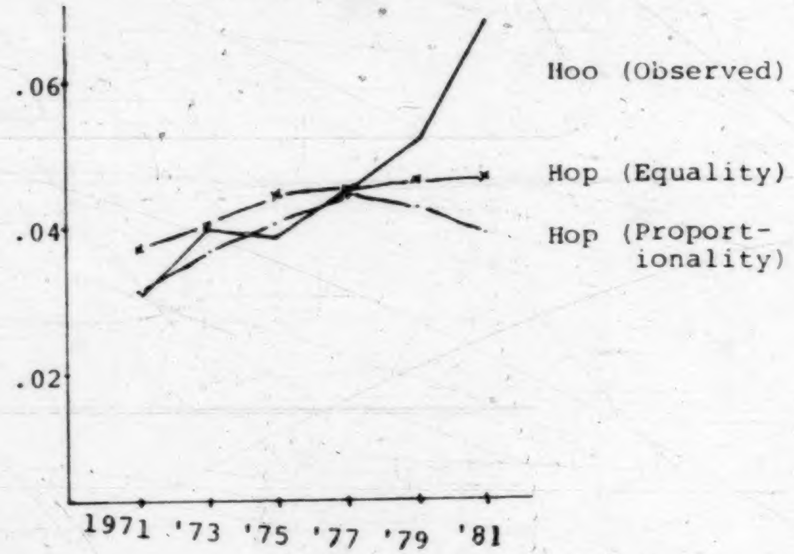


Figure A-2: Permanent Concentration: 1977 Base



Legend:

—— Hoo: Observed Herfindahl Index

—·— Hop: Permanent Herfindahl Index: Proportionality Model

—x— Hop: Permanent Herfindahl Index: Equality Model transitory advantages were responsible for increasing concentration. A similar inference but with a weak transitory effect would be inferred if the shape corresponds to Grossack's figure 1, panel b. The empirical shape of H_{0z} in this study corresponds closely to the shape of figure 1 panel b of Grossack and therefore, it can be concluded that, in the brokerage industry, the scale effect (size advantages or disadvantages) was not prominent and that the observed increase in concentration was partly due to weak transitory advantages and partly due to permanent advantages. A similar interpretation can be offered to the shape of H_{0z} in figure A.2 which has 1977 as its base year.

9. APPENDIX B

9.1 TYPES OF LISTING CONTRACTS IN THE BROKERAGE INDUSTRY

The listing contract between a seller and a broker can take many forms. The three most common types of listing contract that are observed to exist in either the ELS or the MLS market are as follows:

(a) Exclusive Rights To Sale;
(b) Exclusive Agency Listing; and
(c) Open Listing.

9.1.1 (a) Exclusive Rights To Sale

In this type of listing contract, a provision requires that during a prespecified period of time, the seller (home owner) is obliged to pay the commission to the listing broker even if the seller himself finds the buyer. Thus, there need not be any connection between the broker's efforts and the sale. In this case, the seller cannot list with any other broker and no one, not even the seller (owner), can find a buyer so as to negate the obligation to pay a commission to the listing broker. It is to be noted here that a vast majority of the property listings involve this type of listing contract.

9.1.2 (b) Exclusive Agency Listing

In an exclusive agency listing, the seller can avoid paying a commission to the listing broker only if he himself can produce a buyer. If the buyer is produced by any party other than the seller (owner), the commission must be paid to the broker holding the listing contract. Thus, compared to contract (a), the exclusive agency listing gives a little more flexibility to the seller. But the proportion of listings of this type is not very high, indicating its relative unavailability to the home sellers.

9.1.3 (c) Open Listing

In an open listing, the obligation of the seller to pay a commission to the listing broker is contingent upon the latter actually producing a buyer. Contract type (c) is thus most advantageous from the point of view of sellers but is rarely observed in the residential housing market (although it is more frequently observed in the commercial and industrial property transactions).

In choosing from among the three available contracts, it appears that the interest of the seller conflicts with that of the brokers. In terms of broker's preferences, contract (a) is preferable to contract (b), and contract (b) over (c), but the reverse is the case with seller's preferences. The broker prefers contract (a) over (b) and (b) over (c) because there are positive costs which he must incur (in attempting to sell the listed property) once the contract is signed, whatever is the form of contract chosen, whereas in terms of the broker's return, only contract (a) provides a full guarantee of a return. In an actual market situation, it is observed that contract (a) is most frequently available compared to (b) and (c). This observation perhaps indicate that brokers have the upper hand in deciding the type of contract (most suitable to their interests) to be made available in the market.

9.2 THE DEMAND FOR BROKERAGE SERVICES

This section develops a demand function for brokerage services using the standard framework of wealth maximization. The following notation is used in developing the analysis:

U(.) = Utility function of a typical home owner (seller)

y_t = Income of a typical home owner in year t

y_o = Initial income of the home owner

ω = PDV of wealth given by $y_o + \Sigma y_t$

H = Hours (time) available to the home owner

H_w = Hours allocated to work

H_l = Hours allocated to leisure

H_o = Hours allocated to own search for buyers

P_h = Price (wage rate) per hour worked

PB = Reservation price of a typical home buyer

PS = Offer price of a typical home owner

PS^* = Minimum offer price of a typical home owner

T = Hours (quantity) of brokerage services utilised

P_t= Price per hour (quantity) of brokerage services purchased

δ = Kronecker's delta = 1 if T > 0, zero otherwise

Assuming identical sellers, a typical seller's utility function is given by equation (B.1) as a function of his wealth and leisure. He maximises (B.1) subject to the constraints given by (B.2), (B.3), (B.4) and (B.5) below:

$$U = U(\omega , H_1) \tag{B.1}$$

$$y_o = (H - H_1 - H_o)P_h + (PB - PS^*) - \delta . P_t . T \tag{B.2}$$

$$H = H_w + H_1 + H_o \tag{B.3}$$

$$PB = f(H_o , T) \tag{B.4}$$

$$H_o + T \leq H \tag{B.5}$$

The initial income is specified by (B.2) and is derived as follows: his income consists of wage income (first term on the R.H.S. of (B.2) plus the potential surplus generated from the sale of his home (second term on the R.H.S.) minus the cost of brokerage services employed (third term). The last term is positive if Kronecker's delta is unity, zero otherwise. Equation (B.3) gives the allocation of total hours, H, into hours allocated to work, hours allocated for leisure and hours allocated for own search in order to find a prospective buyer. In equations (B.2) and (B.3), hours available to homeowners, H, is considered as exogenously given, i.e. it may be interpreted as the maximum time available to the homeowner after which the house must be sold.[108] Equation (B.4) assumes that the gross selling price, PB, depends positively on his own efforts, H_o and the hours (quantity) of brokerage services, T, employed. Equation (B.5) represents another constraint which specifies that the hours allocated to own search plus the hours of brokerage services employed must not exceed the total time available to the homeowner. The positive but diminishing returns to both factors are specified by equations (B.6) and (B.7):

$$\partial PB/\partial H_o > 0 \; ; \; \partial^2 PB/\partial H_o^2 < 0 \qquad (B.6)$$

$$\partial PB/\partial T > 0 \; ; \; \partial^2 PB/\partial T^2 < 0 \qquad (B.7)$$

It is assumed that the home owner wants to sell his property initially by his own efforts but after a lapse of some time, say H_o, contacts a real estate broker (Note that H_o can be zero). From this model, two corner solutions are possible. First, if the seller's own efforts are successful in finding a buyer, T = 0 and $\delta = 0$. The model can now be solved for optimal values of H_1^*, H_o^*, and U_i^*. Second, after the lapse of time H_o the seller decides to employ the services of a broker, and since the property is not yet sold, T > 0 and δ

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[108] Although this assumption may appear to be too restrictive but in some cases (eg., when the seller faces a deadline for sale due to moving away) it may represent a reasonable approximation. In any case, a more realistic assumption would make the analysis more complicated but would not alter the basic conclusions.

= 1. The model can now be solved for the optimal values of the above mentioned variables including the optimal value of T^*_i, i.e. the optimal level of brokerage services demanded. Note that in this model, P_h can be interpreted as the opportunity cost of own search by sellers ,H_o. Thus an increase in P_h would induce substitution of T for H_o. Further, since P_t reflects the opportunity cost of employing the services of a broker, it is hypothesised that an increase in P_t would induce a substitution of H_o for T. In other words, the optimal demand for brokerage services by the ith home owner , T^d_i, would be related inversely to P_t as given by equations (B.8) and (B.9):

$$T^d_i = T^d_i(P_t , J) \tag{B.8}$$

$$\partial T^d_i/\partial P_t < 0 \tag{B.9}$$

The vector J in (B.8) represents other variables such as P_h, PS^*, y_i ,*et cetera* which influence the demand for brokerage services. Summing over 'S' sellers, the relevant market demand function for brokerage services ,T^d , is representd by equation (B.10):

$$T^d = \Sigma T^d_i = \Sigma T^d_i(P_t , J) = T^d(P_t , J) \tag{B.10}$$

$$\partial T^d/\partial P_t < 0 \tag{B.11}$$

9.3 COST AND SUPPLY OF BROKERAGE SERVICES

Assuming N identical brokers, competitive input markets and the production function T(W, AB, AS), where W, AB, AS stand respectively for brokerage personal selling efforts, units of search to attract buyers, and units of search to attract listings, the supply function can be derived as follows. Given the cost constraint (equation (B.12)), the Lagrangian function is represented by (B.13):

$$TC = P_w.W + P_{ab}.AB + P_{as}.AS \qquad (B.12)$$

$$\Psi = T(W, AB, AS) + \lambda(TC - P_w.W - P_{ab}.AB - P_{as}.AS) \qquad (B.13)$$

The first order conditions for maximising the Lagrangian function (B.13) w.r.t. W, AB, AS and λ are given in equations (B.14) through (B.17) below:

$$\partial\Psi/\partial W = T'_w(W, AB, AS) - \lambda.W = 0 \qquad (B.14)$$

$$\partial\Psi/\partial AB = T'_{ab}(W, AB, AS) - \lambda.P_{ab} = 0 \qquad (B.15)$$

$$\partial\Psi/\partial AS = T'_{as}(W, AB, AS) - \lambda.P_{as} = 0 \qquad (B.16)$$

$$\partial\Psi/\partial\lambda = TC - P_w.W - P_{ab}.AB - P_{as}.AS = 0 \qquad (B.17)$$

Assuming that the second order conditions are satisfied, equations (B.14) to (B.17) can be solved for the optimal demand for inputs W^d, AB^d, and AS^d which, in turn, can be substituted into equation (B.12) to obtain the total cost function of ith firm, TC_i is represented by equation (B.18):

$$TC_i = TC_i(\ T_i;\ P_w,\ P_{ab},\ P_{as}\ ) \tag{B.18}$$

This equation expresses brokerage costs as a ith firm's brokerage services, T_i, *ceteris paribus* . The marginal cost function, MC_i of ith broker is given by equation (B.19):

$$\partial TC_i/\partial T_i = MC_i = MC_i(\ T_i;\ P_w,\ P_{ab},\ P_{as}\ ) \tag{B.19}$$

If the brokerage market is competitive, P_t is given for the individual firm and the ith broker's supply function, T_i^s can be obtained from the marginal cost function as given in equation (B.20):

$$P_t = MC(\ T_i^s\ ) \text{ or } T_i^s = MC^{-1}(\ P_t\ )\ ;\ \partial T_i^s/\partial P_t > 0 \text{ for}$$

$$\text{large } T_i \tag{B.20}$$

This supply function, T_i^s, has the usual upward slope. The aggregate (industry) supply function, T^s, is given by equation (B.21) (summing over N identical brokers):

$$T^s = \Sigma T_i^s = \Sigma MC^{-1}(\ P_t\ ) \tag{B.21}$$

$$\partial T^s/\partial P_1 > 0 \text{ for large } T, \tag{B.22}$$

9.4 CYCLICAL VARIATION IN BROKERAGE PRICING

Earlier (Chapters 2 and 3) it was mentioned that the demand for brokerage output, X, is essentially a derived demand. Therefore, output and price in the brokerage market should reflect the demand and supply conditions in the upstream housing market. Without developing any formal model, Bartlett (1981) argued that the brokerage price would move in counter-cyclical fashion, i.e. increasing during recession and decreasing during a period of boom in the housing market. During recessions, for example, to quote Bartlett:

> ...when there is a large inventory of homes offered for sale and the average turnover time for each is high, the value of a listing decreases.... Conversely, since selling a home is more difficult, the value of broker's efforts in steering the limited buyers toward a particular unit increases. Both effects would tend to bid commission rates upward in response to a "soft" housing market.[8]

According to him, an exactly opposite result holds during a period of boom in the housing market. Although Bartlett's result may hold under certain circumstances, it is unlikely to hold as a general rule. First, his analysis is seriously lacking because of his failure to identify and clearly distinguish between the forces operating from the demand as well as the supply side. Second, different forces which operate on either side may exert opposite influences so that the net outcome becomes ambiguous.

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[8] Bartlett (1981, p 89).

Consider price movements during recessions first. The following factors are likely to put upward pressure on brokerage price from the cost/supply side: (a) Because of a limited number of buyers, a broker's cost of finding a buyer (personal efforts and other selling expenses) would rise; (b) His costs of holding inventories (eg., advertising repeats) of listings (due possibly to an increase in the average time required to sell a listing) would increase; and (c) Since brokerage price is usually expressed as a percentage commission on property value, the lower property value during recession would automatically reduce commission income if the rate is not adjusted upward in order to maintain commission income at the previous level. But there are opposite forces operating from the supply side. For example, although the cost of finding buyers may increase, listings are more readily available (since it is difficult to locate buyers by own efforts, more home owners would seek out brokers). As a result, the broker's cost of finding listings would be reduced. In addition, it is not clear why a broker would try to maintain commission income at the previous level by raising his rate (to compensate for falling house prices) when factor prices (including the opportunity cost of his time) are declining as well. Thus, given these opposing considerations, the net effect on brokerage cost and supply remains unpredictable.

From the demand side, on the other hand, since buyers are more difficult to find, the demand for brokerage services may rise for individual home owners. Again other forces may tend to offset this effect. First, fewer home owners would want to sell their homes because of lower house prices. Second, home owners may have more time available to invest in selling their homes (due possibly to reduced hours at work or lower opportunity cost of their time). This substitution of own efforts for broker's time would reduce demand for brokerage services. The net effect on the change in demand , thus, remains uncertain as well. Since the net effect on demand/supply is uncertain, the effect on price/output cannot be predicted on an *a priori* basis.

During an upswing or boom, on the other hand, a similar but opposite set of arguments would apply. Again the forces may operate to influence supply as well demand. Thus, the magnitude and direction of price movements in the brokerage market in response to cyclical changes in the upstream housing market would depend on the relative shifts of the demand and supply functions in the former market. Since the net effect on supply as well as on demand is uncertain because of opposing forces in either case, the non-collusive model cannot predict, *a priori*, the outcome in unambiguous terms. This result differs from but is more general than the unambiguous result claimed by Bartlett.

10. APPENDIX C

Department of Economics
University of Alberta
Edmonton,Alberta
Canada, T6G 2H4

June 2, 1980

Dear Sir:

As part of a research project in the Department of Economics, University of Alberta, I am sending you a mail return Questionnaire which is intended to survey the Real Estate Brokerage industry in Edmonton.

The purpose of the study is to understand and analyse various aspects of the industry and possibly to make some policy recommendations to improve the efficiency of transactions in the market. The major concern of this study may include, among others, such areas as entry into and exit from the industry, excess capacity, the relative efficiency of MLS transactions *vis-a-vis* the Non-MLS transactions, the size distribution of Agents, the optimal structure of Commission rates and the efficiency of transactions as reflected in the sales-to-listing ratios or selling time in the market.

The study is expected to be of benefit to the Real Estate Board as well as individual members of the Board. It is to be mentioned in this connection that a somewhat similar study was conducted in the province of British Columbia by professor Gideon Rosenbluth of the Department of Economics at the University of British Columbia in which he acknowledged the cooperation he received from the Vancouver Real Estate Board as well as member agents of the Board. I eagerly anticipate similar cooperation from the members of the Edmonton Real Estate Board. I have already received valuable assistance from Mr. J. Arthur Jones of the Edmonton Real Estate Board (ERB) in this respect.

I would like to assure you that the information you will provide will be used with extreme care and strictest confidentiality, and the results of the study will be released in statistical groups only in order to preserve the anonimity of individual agents.

Thank you in advance for your time and attention. I will urge you to complete and return the enclosed Questionnaire by 15th of July, 1980.

If you have any questions or comments, please do not hesitate to contact me at the University of Alberta (432-5144).

Yours Sincerely,

M. Anisul Islam
Lecturer

11. APPENDIX D

QUESTIONNAIRE

A Survey of the Real Estate Brokerage Industry in Edmonton

Department of Economics, The University Of Alberta.

1. Name of the Brokerage agency(and branch, if applicable):________________________.
2. Year in which your agency first recieved a license to operate in Alberta (if known) :____________________.
3. Nature of ownership: (circle one)
   (i) Single properietorship (ii) Partnership
   (iii) Corporation
4. (a) Please indicate how many licensed salesmen your agency/branch (specify) did employ in 1979 to do business in the Edmonton area :
   Total salesmen : No.____ Male: No. ___ Female: No ____
   (b) How many of the above (total) sales personnel did work full-time (35 hours per week or more).
   Full time salespersonnel: No.________.
5. (a)Does your agency sell real Estate in any major city in Alberta *other than* Edmonton ?
   (i) YES (ii) NO
   (b)If yes, please indicate the name of that city (or cities) in Alberta: ____________________________________.
6. a)Does your agency sell real Estate in any province in Canada *other than* Alberta?
   (i) YES (ii) NO
   (b) If yes, indicate the name of that province (or provinces) ____________________________________
7. (a)From the following list, please check the activities in which your agency is currently engaged:
   (i) Residential Brokerage (ii) Commercial and Industrail Brokerage
   0 Appraising (iii) Property management
   (iV) Counselling (V) Building Develpoping & subdividing
   (Vi) others (please specify):__________________________.
   (b)From the above list, please indicate one activity which generates most of the income to your agency:__________________.
8. (a)How are your sales personnel compensated? (check one)
   (i) Salary (ii) Commission (iii) Salary plus Commission
   (iv) Commission plus Bonus (v) Commission plus profit sharing
   (vi) others(please specify)__________.
   b)If sales personnel are compensated on the basis of commission, please indicate what percentage of the commssion is given to the sales personal?
   (i)for a listing ____ percent.
   (ii)for a sale_______ percent.
9. (a)What is the approximate annual (yearly) turnover rate

(approximate number of salesman leaving your agency divided by total sales force) for sales personnel in your agency? _____percent.
b)Do you consider this higher or lower than industry average?
0 Higher 0 Lower

10. (a) Do you have a membership in the Edmonton Real Estate Board?
0 YES 0 NO
b)If yes, year of initial membership in the board was ____(year).

11. (a)Please indicate total number(approximate)of properties Listed by your agency/branch(specify) in Edmonton in 1979: No.________________.
(b)Out of these listings, approximately what percentage were initially listed through:
(i)The MLS listings ______ percent.
(ii)The NON-MLS(open & exclusive)_______ percent.

12. Please indicate total number (approximate) of properties(both MLS and NON-MLS) sold by your agency/branch in *Edmonton* in *1979*:
(i)Total properties sold: No._______.
(ii)Approximate total dollar value of sales: $________.
(b)Out of this total properties sold in 1979, approximately what percentage were sold through:
(i)The MLS ________ (percent)
(ii)The Non-MLS ______ (percent).

13. a)What commission rate do your salesmen *usually* charge on MLS transactions?(check one)
(i) less than 5% (ii) 5-6 percent (iii) 6-7 percent
(iv) 6-7 percent (v) 7 percent (vi) Above 7 percent.
b)What Commission rate do your salesmen *usually* charge on Non-MLS transactions?
(i) 2-4 percent (ii) 4-5 percent (iii) 5-6 percent (iv) 6 percent (v) Above 6 percent.

14. Concerning question number 13(a) and 13(b) above, what percentage of properties involve commission rate which differ from the "usual" commission rate ? ______ percent.

15. (a) Does the Commission rate charged differ depending on the value of the property (assume the property is valued less than $100,000)?
(i) YES (ii) NO
(b) If Yes, please indicate the Commission rate charged on the following category of property values:

Property Value	*Commission Rate(Percent)*
(i) Less than $50,000	________
(ii) $50,000 - $75,000	________
iii) $75,000 - 100,000	________
(iv) Above $100,000(Specify Breakdown)	________

16. (a) In the case of MLS transactions, if the listing

agent differs from the selling agent, how is the commission income distributed?

(i) Listing Agent ______(percent)
(ii) Selling Agent ______(percent)
(iii) MLS (for its services) ______(percent)

(b) In the case of MLS transactions, if the selling agent is a non-member, how is the commission income distributed?

(i) Listing Agent _______(percent)
(ii) on-Member Selling Agent _______(percent)
(iii) MLS (for its services) _______(percent)

17. In the case of Questions 16(a) and 16(b) above, who determines the commission sharing arrangements?

(i) The Listing Agent; (ii) The Selling Agent
(iii) Both the Listing Agent and the Selling Agent together;
(iv) The Real Estate Board, (v) Others (please specify) ________________________________

18. (a) Has your volume of business in Edmonton been growing over time?

(i) YES (ii) NO

(b) If yes, please indicate the approximate growth rate per annum:

(i) 0-10 percent (ii) 0-20 percent (iii) 0-30 percent
(iv) 30 - 40 percent (v) 50 percent (vi) above 50 percent.

19. (a) From the following List, please check the form(s) of advertising used by your agency:

(i) Classified Ads;(ii) Other Newspaper Ads;(iii) Direct Mail;(iv) Television;(v) Radio;(vi) Lot Signs; (Vii) Bill Boards;(viii) Form and Personal Letters; (ix) Yellow Pages;(x) Others (specify) ____________

(b) Please indicate which one of the above form(s) is the single most important form of advertising by your Agency? ______________________

(c) Please indicate, on average, approximately what percentage of your Yearly Commission income is spent on Advertising?

(i) Less than 5% ;(ii) 5 - 10% ;(iii) 10 - 15% ;
(iv) 15 - 20% ;
(v) Above 20% .

20. (a) Does the MLS service seem to be operating effictively?

(i) Yes (ii) NO

b) If No, please explain the difficulty

21. (a) What is, in your opinion, the most significant problem facing the Real Estate Brokerage industry in Edmonton today?

(b) What suggestion(s) do you have to resolve that specific problem?

12. APPENDIX E

Appendix E gives some summary tables (Tables E.1 through E.6) to indicate the relative importance and growth of different types transactions processes (eg. MLS, ELS, and sale by owners) in Canada and the United States.

TABLE E.1: Distribution of Major U.S. Cities by % of Real Estate Sales by Owners, 1973-74

% of Sales by Owners	No. of Cities	% of Cities
Less than 5%	6	9.5
5 - 10%	12	19.1
10 - 15%	19	30.2
15 - 20%	12	19.1
20 - 25%	8	12.6
25 - 30%	6	9.5
Total	63	100.0

*Source : Adapted and compiled from a a report by J. Brasser,
J. Bresser Conferences Inc., 16135 Harper, Detroit, Michigan, U.S.A.

TABLE E.2: Growth of MLS Sales in Edmonton Real Estate Brokerage Market, 1956-1982

(in million dollars)

Year	Value of Sales	% change (year-year)	Commissions	% change (year-year)
1956	9.4	-----	0.66	-----
1957	11.1	+18.1	0.78	+18.1
1958	11.9	+7.2	0.83	+7.2
1959	10.1	-15.2	0.71	-15.2
1960	10.6	+4.9	0.74	+4.9
1961	10.3	-2.8	0.72	-2.8
1962	13.1	+27.2	0.92	+27.2
1963	19.3	+47.3	1.35	+47.3
1964	19.2	-0.5	1.34	-0.5
1965	22.2	+15.6	1.55	+15.6
1966	31.6	+42.3	2.21	+42.3
1967	40.5	+28.2	2.84	+28.2
1968	48.4	+19.5	3.39	+19.5
1969	59.7	+23.3	4.18	+23.3
1970	71.1	+19.1	4.98	+19.1
1971	85.9	+20.8	6.01	+20.8
1972	117.2	+36.4	8.20	+36.4
1973	161.4	+37.7	11.30	+37.7
1974	240.6	+49.1	16.84	+49.1
1975	363.5	+51.1	25.45	+51.1
1976	417.7	+14.9	29.24	+14.9
1977	571.1	+36.7	39.98	+36.7
1978	703.8	+23.2	49.27	+23.2
1979	1103.6	+56.8	77.25	+56.8
1980	953.1	-13.6	66.72	-13.6
1981	941.5	-1.2	65.91	-1.2
1982	507.1	-46.1	35.50	-46.1

Note: a - Commisions are estimated by assuming a commission rate of 7% on all MLS transactions.

*Source : MLS Sales Summaries, various issues.

TABLE E.3: Growth of MLS Sales in Toronto Real Estate Brokerage Market, 1953-1968

(in million dollars)

Year	Value of Sales	% change (year-year)	Commissions	% change (year-year)
1953	-38.93	-----	2.73	-----
1954	44.83	+15.2	3.14	+15.2
1955	53.15	+18.6	3.72	+18.6
1956	73.49	+38.2	5.14	+38.2
1957	93.07	+26.7	6.51	+26.7
1958	128.17	+37.7	8.97	+37.7
1959	158.82	+23.9	11.12	+23.9
1960	151.83	-4.4	10.63	-4.4
1961	151.32	-0.3	10.59	-0.3
1962	161.88	+6.9	11.33	+6.9
1963	183.27	+13.2	12.83	+13.2
1964	241.22	+31.6	16.89	+31.6
1965	281.17	+16.6	19.68	+16.6
1966	326.68	+16.2	22.87	+16.2
1967	367.40	+12.5	25.72	+12.5
1968	430.31	+17.1	30.12	+17.1

Notes: a - Value of sales were calculated by multiplying the no. of units sold by the average price of house for that year.
b - Commissions were estimated by assuming a 7% commission rate on all MLS transactions

*Source : Adapted and compiled from the Toronto Board Report (1969).

TABLE E.4: Growth of MLS Sales in Canada and the Provinces, 1973-1982

(in million dollars)

Year	Canada	B.C.	Alberta	Sask.	Man.	Ont	Que	Atlantic
Sales								
1973	3460.7	695.0	358.2	81.2	138.7	1882.6	254.8	50.1
1976	7295.1	1378.7	970.3	256.2	340.0	3641.9	565.7	142.3
1979	12005.3	2304.4	2218.7	385.8	381.5	5366.6	1100.9	246.2
1982	12643.6	2637.2	1589.3	399.8	355.0	6279.0	1043.5	339.6
Commissions								
1973	242.2	48.7	25.1	5.7	9.7	131.8	17.8	3.5
1976	510.7	96.5	67.9	17.9	23.8	254.9	39.6	10.0
1979	840.4	161.3	155.3	27.0	26.7	375.7	77.1	17.2
1982	885.1	184.6	111.3	28.0	24.9	439.5	73.1	23.8
% change (period-period): both sales and commissions								
1973-76	+110.9	+98.2	+170.5	+214.0	+145.4	+93.4	+122.5	+185.7
1976-79	+64.6	+67.2	+128.7	+50.8	+12.2	+47.4	+94.7	+72.0
1979-82	+5.3	+14.4	-28.3	+3.7	+156.7	+17.0	-5.2	+38.2
1973-82	+265.4	+279.1	+343.4	+391.2	+156.7	+233.5	+310.7	+580.0
annual average rate of growth: 1973-1982 period								
1973-82	+29.5	+31.0	+38.2	+43.5	+17.4	+25.9	+34.5	+64.4

Notes: a - The Atlantic provinces are N.S., NB., P.E.I., and Newfoundland
b - Commissions were calculated by assuming a 7% commission rate on all MLS transactions.
c - Since a fixed commission rate is applied, the growth of sales and commissions are identical

*Source : Adapted and compiled from the CREA Report (1982)

TABLE E.5: Distribution of Real Estate Brokers and Salesmen in Canada, 1969 and 1973

	Total Licensees			Total Membership			Membership as % of Licensees		
Provinces	1969	1973	% change	1969	1973	% change	1969	1973	% change
B.C.	5416	7520	+38.9	4555	6726	+47.7	84.1	89.4	+5.3
Alberta	3027	4350	+43.7	2017	3261	+61.7	66.6	75.0	+8.4
Sask	1012	1100	+8.7	640	956	+49.4	63.2	86.9	+23.7
Man.	1521	1900	+24.9	996	1433	+43.9	65.5	75.4	+9.9
Ont.	na	25554	-----	na	18947	-----	na	74.1	-----
Que.	2790	4834	+73.3	2034	2906	+42.9	72.9	60.1	-12.8
N.S.	na	833	-----	na	743	-----	na	89.2	-----
N.B.	206	362	+75.7	153	309	+101.9	74.3	85.4	+11.1
P.E.I.	na	91	-----	na	66	-----	na	72.4	-----
N.F.	na	158	-----	na	113	-----	na	71.5	-----
Canada	na	46702	-----	na	35460	-----	na	75.9	-----

Notes: a - 1969 data are taken from CREA Report (1970), p 20
b - 1973 data are taken from CREA Report (1975a), p 41
c - Membership represents membership in the CREA
na - Not available
- - Cannot be calculated

*Source : Adapted and compiled from the CREA Reports (1970, 1974, and 1975a)

TABLE E.6: Distribution of Brokers and Salesmen: Canada and the Provinces, 1974

Province	No. of Brokers	No. of Salesmen	Salesmen per Broker
B.C.	1175	5558	4.7
Alberta	480	3380	7.1
Sask.	167	761	4.6
Man.	213	1091	5.1
Ont.	2697	16217	6.0
Que.	369	2570	7.0
N.S.	134	652	4.9
N.B.	82	242	3.0
P.E.I.	16	50	3.1
N.F.	31	138	4.5
Canada	5364	30659	5.7

*Source : Adapted and compiled from CREA Report (1975a)